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TWENTY-NINTH ANNUAL REPORT

OF THE

HEALTH DEPARTMENT

153-417

OF THE

CITY OF BOSTON

FOR THE YEAR 1900



BOSTON  
MUNICIPAL PRINTING OFFICE  
1901



## ORGANIZATION OF THE HEALTH DEPARTMENT.

---

SAMUEL H. DURGIN, *Chairman.*

EDWIN L. PILSBURY.

ROBERT COX.

---

CHARLES E. DAVIS, JR., *Secretary.*





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HEALTH DEPARTMENT, OLD COURT HOUSE,

BOSTON, February 1, 1901.

HON. THOMAS N. HART,

*Mayor of the City of Boston:*

SIR, — The Board of Health respectfully submits its twenty-ninth annual report, covering the work of the Health Department for the past year, together with a statement of the receipts and expenditures of the Department from February 1, 1900, to February 1, 1901.

A statement of the sanitary condition of the City, as called for, may be approximately given by a brief review of the changes which have taken place within a few years and the conditions as they exist to-day.

The water supply of Boston is well provided for. It is of good quality, ample in quantity, and well protected against the danger of pollution, by law, and with the most trustworthy custodians.

The food supply is in abundance, of excellent quality, and under good supervision. The principal markets are kept scrupulously neat, and are a credit to the City. Meat, fish, fruits, and vegetables arrive in the city in better condition now than ever before. Some small markets, pedlers on the streets, and Saturday evening venders of meats and other provisions are less neat and trustworthy, and continue to need particular watching. The milk supply was never better. It is faithfully watched by the Bureau of Milk Inspection, and all places for its production, detention and

sale are now under regulations of this Department and watched with care.

Owing to the unsatisfactory condition of the milk drawn from cows in the sale sheds at Brighton on Tuesdays and Wednesdays of each week, and the difficulties in the way of securing anything like cleanliness in handling it, the Board was compelled to order all such milk to be turned into the public sewer as soon as drawn. Since the order was issued no such milk has been used as food from that place.

The abattoir in Brighton is the only place left in the City for the slaughtering of animals for food, and this is provided with a competent and trustworthy inspector, who is on constant duty at that place.

The killing of chickens by the Hebrew people has been driven from the numerous dwellings, sheds, and other unsuitable places in the City, and permitted only in four different sections of the City, in buildings fitted up specially for the purpose. This change was a great advance, from a sanitary standpoint, although the troubles are not yet over, and this business will soon have to go to the abattoir or out of town.

Offensive trades and employments have been regulated and made less noisome and dangerous. Bone-boiling and fat-rendering establishments, lime kilns, phosphate works, and a variety of other offensive trades are less in number, and nearly all have undergone such modifications as to be comparatively unobjectionable and rarely complained of. Soap factories and gas plants have ceased to be intolerable nuisances and have become inoffensive manufactories.

In the last fifteen years 8,889 privy vaults have been discontinued by order of the Board, and only rarely has one been built during this time, and then only as a practical necessity. The same is true to nearly the same extent with cesspools, which are now allowed only in the absence of sewers and for surface water.

Dead animals, such as horses, mules, pigs and goats, are quickly removed from the City without expense, on notification to the proper parties.

Eighty-three old stables, which were practically worn out and unfit for repairs or so badly situated as to be a serious annoyance to occupants of other buildings, have been ordered removed by order of the Board during the last four years. Other stables have been vigorously altered to conform to reasonable sanitary conditions. Stables are now permitted

only upon conditions for better sanitary construction and care, and the storing of manure on the premises for more than twenty-four hours will soon be prohibited.

The streets, although better paved than formerly, and somewhat cleaner are, nevertheless, too rough and uneven on the surface for economical and comfortable use, or for the economical and necessary cleaning.

The "lanes," "alleys" and "courts" of the City are generally in a bad sanitary condition, and subject to a great deal of complaint. These places, nominally private, are receptacles for all sorts of waste material, and no one assumes the care, as a rule, until forced by order of the Board of Health or the courts. A small improvement in these private alleyways has taken place within a few years. Under a law passed a few years ago the City has laid out and paved a few of these alleyways at the expense of the abutters, and the City is made responsible in the act, for keeping such alleyway "free from any substance which is liable to cause sickness or a nuisance."

This is a singular way of saying that the City must keep them clean, if that is what was intended.

The tenement-house population is large, and composed generally of a class of persons who are too poor or otherwise indisposed to promote cleanliness and healthful conditions. This is a great drawback in any city, and Boston does not differ greatly in this respect from most other large cities. A very large amount of our work is done in the tenement houses and a fair amount of improvement in their conditions can be seen as a result. The lodging houses and their occupants have been most radically changed from the unwashed tramp in his day clothes, sleeping on the floor, on settees, or filthy beds in unclean, unventilated and overcrowded places, we have clean, light, and ventilated dormitories, supplied with such necessary furnishings and conveniences, and under such rules and care as health and cleanliness require.

The number of lodging houses has greatly diminished, owing to stringent regulations.

Barber shops had become in many instances unclean, and, for want of proper sanitary care, had become a source of danger to health. They have been placed under regulations, greatly improved, and are under constant supervision.

The plumbing and gas-fitting in buildings have been brought to a higher standard of excellence, which has diminished the risk to life, and greatly increased the healthful conditions.

The docks have been greatly relieved from the ingress of sewage, and other wastes, and are gradually improving.

The tide water flats have been considerably reduced in area by filling. Those remaining are less offensive as a whole than formerly, but in places the condition of the flats at low tide is bad, needs attention and will be mentioned elsewhere in the report. There are still some drains discharging overboard from private property, but these drains are being cut off as fast as practicable.

Vacant lots are much less used for the deposit of rubbish and filth than was formerly the case, and the means for making owners clean them up are much greater.

#### MORTALITY.

The total number of deaths for the year was 11,678, an increase over the previous year of 511 deaths. The population, by census in the middle of the year, is 560,892. The death-rate for the year, as calculated on this population is 20.82 per 1,000 inhabitants. This rate is more by .70 than that of the previous year, and with three exceptions the lowest on record. There were 3,787\* deaths from zymotic diseases, including consumption, an increase of deaths from the same group of the previous year. There were 223 more deaths from diphtheria and croup than in 1899, with a proportionate increase in the number of cases. The percentage of deaths to the number of cases of diphtheria reported was 10.79 as against 9.77 per cent. the preceding year. There were 181 deaths from scarlatina, 107 more deaths than in the preceding year, and higher than the average of the five previous years. Typhoid fever has caused 143 deaths during the year, 22 less deaths than the preceding year. Forty-seven of the deaths from this cause occurred during the months of August, September and October, and 88 of the whole number died between the ages of 20 and 40 years.

There were 88 deaths from measles during the year. The number of deaths of children under five years of age was 3,752, compared with 3,591 for the previous year, showing an increase of 161 deaths. The respiratory diseases are still the most fatal, causing fully 26 per cent. of the whole mortality the past year, as against 27 per cent. in 1899.

---

\*The increased number of deaths in the zymotic group in 1900 over that of 1899 is chiefly due to the incorporating into this group, pulmonary, laryngeal, and general tuberculosis, with some forms of diarrheal diseases.

## COMPARATIVE DEATHS IN AMERICAN AND FOREIGN CITIES.

The following tables have been prepared to show the comparison of deaths in a few large American and foreign cities, as compared with the City of Boston. It is to be regretted that the amount of information desired is not fully complete, owing to the scarcity of material and information furnished, but in their present condition, as a matter of reference, they may be of value:

**Boston.**

| YEARS.    | Population. | Total Deaths. | Population of Children under 5 years of age. <sup>1</sup> | Deaths of Children under 5 years of age. | Deaths from Diphtheria. | Deaths from Scarlatina. | Deaths from Typhoid Fever. | Deaths from Measles. |
|-----------|-------------|---------------|-----------------------------------------------------------|------------------------------------------|-------------------------|-------------------------|----------------------------|----------------------|
| 1880..... | 362,839     | 8,531         | 29,649                                                    | 3,349                                    | 588                     | 33                      | 154                        | 49                   |
| 1881..... | 368,190     | 9,016         | 30,809                                                    | 3,314                                    | 601                     | 35                      | 207                        | 108                  |
| 1882..... | 373,620     | 8,995         | 31,969                                                    | 3,151                                    | 458                     | 75                      | 212                        | 25                   |
| 1883..... | 379,129     | 9,740         | 33,129                                                    | 3,627                                    | 445                     | 211                     | 198                        | 152                  |
| 1884..... | 384,720     | 9,622         | 34,289                                                    | 3,570                                    | 345                     | 209                     | 216                        | 13                   |
| 1885..... | 390,398     | 9,618         | 35,449                                                    | 3,466                                    | 334                     | 156                     | 152                        | 84                   |
| 1886..... | 401,374     | 9,268         | 36,582                                                    | 3,186                                    | 329                     | 81                      | 135                        | 36                   |
| 1887..... | 412,663     | 10,073        | 37,717                                                    | 3,662                                    | 316                     | 196                     | 183                        | 119                  |
| 1888..... | 424,274     | 10,197        | 38,849                                                    | 3,509                                    | 470                     | 65                      | 170                        | 27                   |
| 1889..... | 436,208     | 10,259        | 39,983                                                    | 3,633                                    | 564                     | 23                      | 196                        | 48                   |
| 1890..... | 448,477     | 10,181        | 41,117                                                    | 3,349                                    | 401                     | 42                      | 155                        | 19                   |
| 1891..... | 457,772     | 10,571        | 42,251                                                    | 3,608                                    | 232                     | 64                      | 154                        | 21                   |
| 1892..... | 467,260     | 11,236        | 43,383                                                    | 3,735                                    | 414                     | 262                     | 137                        | 19                   |
| 1893..... | 476,945     | 11,710        | 44,518                                                    | 3,987                                    | 476                     | 248                     | 148                        | 27                   |
| 1894..... | 486,830     | 11,520        | 45,654                                                    | 4,108                                    | 817                     | 192                     | 141                        | 8                    |
| 1895..... | 501,083     | 11,329        | 46,787                                                    | 3,935                                    | 588                     | 114                     | 163                        | 19                   |
| 1896..... | 516,305     | 11,634        | 47,920                                                    | 4,055                                    | 516                     | 121                     | 162                        | 27                   |
| 1897..... | 528,912     | 11,154        | 49,053                                                    | 3,708                                    | 411                     | 136                     | 173                        | 21                   |
| 1898..... | 541,827     | 10,886        | 50,185                                                    | 3,577                                    | 170                     | 33                      | 185                        | 27                   |
| 1899..... | 555,067     | 11,167        | 51,317                                                    | 3,591                                    | 277                     | 74                      | 165                        | 33                   |
| 1900..... | 510,892     | 11,678        | 52,449                                                    | 3,752                                    | * 537                   | 181                     | 143                        | 88                   |

<sup>1</sup> Corrected by census years. <sup>2</sup> Including group.

## Philadelphia, Pa.

| YEARS.                  | Population. | Total Deaths. | Population of Children under 5 years of age. | Deaths of Children under 5 years of age. | Deaths from Diphtheria. | Deaths from Scarlatina. | Deaths from Typhoid Fever. | Deaths from Measles. |
|-------------------------|-------------|---------------|----------------------------------------------|------------------------------------------|-------------------------|-------------------------|----------------------------|----------------------|
| 1880 <sup>1</sup> ..... | 846,980     | 17,711        | <sup>1</sup> 91,544                          | 6,594                                    | 323                     | 291                     | 498                        | 108                  |
| 1881.....               | 868,000     | 19,515        | <sup>2</sup> 92,744                          | 7,124                                    | 457                     | 486                     | 645                        | 17                   |
| 1882.....               | 886,539     | 20,059        | 94,004                                       | 7,254                                    | 983                     | 310                     | 650                        | 91                   |
| 1883.....               | 907,041     | 20,076        | 95,234                                       | 7,417                                    | 1,006                   | 561                     | 579                        | 58                   |
| 1884.....               | 927,995     | 19,999        | 96,465                                       | 7,606                                    | 680                     | 540                     | 662                        | 96                   |
| 1885.....               | 949,432     | 21,392        | 97,965                                       | 8,188                                    | 600                     | 375                     | 610                        | 131                  |
| 1886.....               | 971,363     | 20,005        | 98,925                                       | 7,351                                    | 411                     | 248                     | 618                        | 19                   |
| 1887.....               | 993,801     | 21,719        | 100,155                                      | 8,421                                    | 416                     | 159                     | 621                        | 358                  |
| 1888.....               | 1,016,758   | 20,372        | 101,386                                      | 7,269                                    | 350                     | 235                     | 785                        | 24                   |
| 1889.....               | 1,040,245   | 20,536        | 102,616                                      | 7,752                                    | 375                     | 298                     | 736                        | 92                   |
| 1890 <sup>1</sup> ..... | 1,046,964   | 21,732        | <sup>1</sup> 103,847                         | 7,913                                    | 528                     | 189                     | 666                        | 105                  |
| 1891.....               | 1,069,264   | 23,367        | 105,077                                      | 8,479                                    | 913                     | 341                     | 684                        | 25                   |
| 1892.....               | 1,092,168   | 24,305        | .....                                        | 9,305                                    | 1,425                   | 484                     | 539                        | 74                   |
| 1893.....               | 1,115,562   | 23,655        | .....                                        | 8,690                                    | 892                     | 267                     | 456                        | 88                   |
| 1894.....               | 1,139,457   | 22,680        | .....                                        | 8,160                                    | 1,047                   | 154                     | 369                        | 33                   |
| 1895.....               | 1,163,864   | 23,797        | .....                                        | 8,401                                    | 1,020                   | 79                      | 469                        | 84                   |
| 1896.....               | 1,188,798   | 23,982        | .....                                        | 8,661                                    | 862                     | 61                      | 402                        | 191                  |
| 1897.....               | 1,214,256   | 22,735        | .....                                        | 7,605                                    | 1,231                   | 282                     | 401                        | 64                   |
| 1898.....               | 1,240,266   | 23,790        | .....                                        | 7,998                                    | 998                     | 114                     | <sup>3</sup> 639           | 234                  |
| 1899.....               | 1,266,832   | 23,796        | .....                                        | 7,056                                    | 849                     | 132                     | 946                        | 7                    |
| 1900.....               | 1,293,697   | 25,078        | .....                                        | 8,078                                    | 898                     | 163                     | 449                        | 382                  |

<sup>1</sup> Census years.<sup>2</sup> Estimated on the increase of census years.<sup>3</sup> Seventy-three of these were soldiers who contracted the disease in camps.



## HEALTH DEPARTMENT.

7

(Old City of) New York, N. Y.

| YEARS.                  | Population. | Total Deaths. | Population of Children under 5 years of age. <sup>1</sup> | Deaths of Children under 5 years of age. | Deaths from Diphtheria. | Deaths from Scarlatina. | Deaths from Typhoid Fever. | Deaths from Measles. |
|-------------------------|-------------|---------------|-----------------------------------------------------------|------------------------------------------|-------------------------|-------------------------|----------------------------|----------------------|
| 1880 <sup>1</sup> ..... | 1,209,268   | 81,937        | 140,673                                                   | 14,650                                   | 1,390                   | 618                     | 372                        | 479                  |
| 1881.....               | 1,246,011   | 88,624        | 144,947                                                   | 17,737                                   | 2,249                   | 1,964                   | 594                        | 429                  |
| 1882.....               | 1,233,870   | 37,924        | 149,351                                                   | 17,520                                   | 1,625                   | 2,066                   | 516                        | 913                  |
| 1883.....               | 1,322,880   | 34,011        | 153,889                                                   | 13,956                                   | 1,009                   | 744                     | 625                        | 716                  |
| 1884.....               | 1,363,075   | 35,044        | 158,565                                                   | 15,272                                   | 1,090                   | 608                     | 476                        | 762                  |
| 1885.....               | 1,404,401   | 35,682        | 163,368                                                   | 15,267                                   | 1,325                   | 559                     | 406                        | 786                  |
| 1886.....               | 1,447,166   | 37,351        | 168,347                                                   | 16,121                                   | 1,727                   | 371                     | 433                        | 668                  |
| 1887.....               | 1,491,137   | 38,983        | 173,462                                                   | 16,766                                   | 2,167                   | 569                     | 421                        | 767                  |
| 1888.....               | 1,536,444   | 40,175        | 178,783                                                   | 17,358                                   | 1,914                   | 1,361                   | 364                        | 591                  |
| 1889.....               | 1,583,120   | 39,679        | 184,164                                                   | 17,152                                   | 1,686                   | 1,242                   | 397                        | 470                  |
| 1890.....               | 1,631,232   | 40,108        | 189,760                                                   | 16,305                                   | 1,262                   | 408                     | 352                        | 730                  |
| 1891.....               | 1,680,796   | 43,659        | 195,525                                                   | 18,224                                   | 1,361                   | 1,220                   | 324                        | 663                  |
| 1892.....               | 1,827,396   | 44,317        | .....                                                     | 18,589                                   | 1,425                   | 975                     | 399                        | 863                  |
| 1893.....               | 1,891,306   | 44,479        | .....                                                     | 17,914                                   | 1,968                   | 552                     | 381                        | 390                  |
| 1894.....               | 1,967,452   | 41,175        | .....                                                     | 17,596                                   | 2,359                   | 541                     | 326                        | 584                  |
| 1895.....               | 1,879,196   | 43,420        | 210,523                                                   | 18,221                                   | 1,634                   | 468                     | 322                        | 793                  |
| 1896 <sup>1</sup> ..... | 1,934,077   | 41,622        | 210,523                                                   | 16,807                                   | 1,555                   | 402                     | 297                        | 714                  |
| 1897.....               | 1,990,562   | 38,887        | 226,327                                                   | 15,394                                   | 1,377                   | 500                     | 299                        | 391                  |
| 1898.....               | 2,048,880   | 40,438        | 233,150                                                   | 15,591                                   | 922                     | 524                     | 376                        | 446                  |
| 1899.....               | 2,117,106   | 39,911        | 240,714                                                   | 14,391                                   | 940                     | 332                     | 294                        | 379                  |
| 1900.....               | 2,053,979   | 43,227        | 233,537                                                   | 15,646                                   | 1,121                   | 315                     | 372                        | 470                  |

<sup>1</sup> Estimated July 1, 1896.

**Chicago, Ill.**

| YEARS.     | Population<br>Estimated. | Total Deaths. | Population of<br>Children un-<br>der 5 years<br>of age. | Deaths of Chil-<br>dren under 5<br>years of age. | Deaths from<br>Diphtheria. | Deaths from<br>Scarlatina. | Deaths from<br>Typhoid<br>Fever. | Deaths from<br>Measles. |
|------------|--------------------------|---------------|---------------------------------------------------------|--------------------------------------------------|----------------------------|----------------------------|----------------------------------|-------------------------|
| 1880 ..... | 503,298                  | 10,462        |                                                         |                                                  |                            |                            |                                  |                         |
| 1881 ..... | 540,000                  | 13,874        |                                                         |                                                  |                            |                            |                                  |                         |
| 1882 ..... | 560,639                  | 13,234        |                                                         | 6,645                                            |                            |                            |                                  |                         |
| 1883 ..... | 580,000                  | 11,555        |                                                         | 5,875                                            |                            |                            |                                  |                         |
| 1884 ..... | 630,000                  | 12,471        |                                                         | 6,666                                            |                            |                            |                                  |                         |
| 1885 ..... | 665,000                  | 12,474        |                                                         | 6,187                                            | 706                        | 279                        | 496                              | 78                      |
| 1886 ..... | 704,000                  | 13,699        |                                                         | 6,763                                            | 944                        | 220                        | 488                              | 126                     |
| 1887 ..... | 760,000                  | 15,409        |                                                         | 7,568                                            | 1,002                      | 190                        | 381                              | 341                     |
| 1888 ..... | 830,000                  | 15,772        |                                                         | 7,533                                            | 858                        | 184                        | 375                              | 151                     |
| 1889 ..... | 1,106,000                | 16,946        |                                                         | 8,204                                            | 1,126                      | 185                        | 453                              | 204                     |
| 1890 ..... | 1,200,000                | 21,869        |                                                         | 9,954                                            | 881                        | 193                        | 1,008                            | 67                      |
| 1891 ..... | 1,250,000                | 27,754        |                                                         | 12,801                                           | 958                        | 499                        | 1,997                            | 265                     |
| 1892 ..... | 1,438,000                | 26,219        |                                                         | 11,662                                           | 1,014                      | 382                        | 1,489                            | 185                     |
| 1893 ..... | 1,600,000                | 27,095        |                                                         | 12,364                                           | 975                        | 329                        | 670                              | 234                     |
| 1894 ..... | 1,567,727                | 23,701        |                                                         | 12,363                                           | 841                        | 190                        | 491                              | 182                     |
| 1895 ..... | 1,600,000                | 24,319        | 227,200                                                 | 10,449                                           | 1,775                      | 77                         | 518                              | 158                     |
| 1896 ..... | 1,619,226                | 23,262        | 192,453                                                 | 15,336                                           | 955                        | 54                         | 751                              | 73                      |
| 1897 ..... | 1,619,226                | 21,809        | 192,453                                                 | 8,546                                            | 702                        | 81                         | 437                              | 139                     |
| 1898 ..... | 1,650,000                | 22,747        | 196,193                                                 | 8,135                                            | 622                        | 67                         | 636                              | 55                      |
| 1899 ..... | 1,950,000                | 25,503        | 196,299                                                 | 8,880                                            | 843                        | 533                        | 442                              | 168                     |
| 1900 ..... | 1,698,575                | 24,941        | 226,824                                                 | 8,282                                            | 797                        | 226                        | 337                              | 194                     |

<sup>1</sup> School census, July 1, 1896.

## Brooklyn, N. Y.

| YEARS.    | Population. | Total Deaths. | Population of Children under 5 yrs. of age. | Deaths of Children under 5 yrs. of age. | Deaths from Diphtheria. | Deaths from Scarlatina. | Deaths from Typhoid Fever. | Deaths from Measles. | Deaths from Consumption. |
|-----------|-------------|---------------|---------------------------------------------|-----------------------------------------|-------------------------|-------------------------|----------------------------|----------------------|--------------------------|
| 1885..... | 687,000     | 15,369        | 89,310                                      | 6,756                                   | 519                     | 363                     | 153                        | 175                  | 1,995                    |
| 1886..... | 747,000     | 15,790        | 97,110                                      | 7,000                                   | 782                     | 340                     | 123                        | 106                  | 2,085                    |
| 1887..... | 778,800     | 17,079        | 101,140                                     | 7,577                                   | 950                     | 271                     | 143                        | 172                  | 2,026                    |
| 1888..... | 810,000     | 18,061        | 105,300                                     | 8,019                                   | 984                     | 476                     | 153                        | 59                   | 2,051                    |
| 1889..... | 842,000     | 18,480        | 109,460                                     | 8,265                                   | 1,101                   | 273                     | 161                        | 205                  | 2,055                    |
| 1890..... | 875,000     | 19,827        | 113,750                                     | 8,462                                   | 902                     | 227                     | 182                        | 111                  | 2,169                    |
| 1891..... | 910,000     | 21,349        | 118,300                                     | 9,888                                   | 766                     | 485                     | 180                        | 203                  | 2,117                    |
| 1892..... | 945,000     | 20,807        | 122,850                                     | 8,971                                   | 775                     | 412                     | 162                        | 168                  | 2,128                    |
| 1893..... | 980,000     | 21,017        | 127,400                                     | 8,763                                   | 607                     | 307                     | 179                        | 111                  | 2,174                    |
| 1894..... | 1,045,000   | 21,183        | 135,850                                     | 9,235                                   | 1,279                   | 188                     | 158                        | 204                  | 2,260                    |
| 1895..... | 1,110,000   | 22,568        | 124,000                                     | 9,277                                   | 1,139                   | 124                     | 173                        | 192                  | 2,299                    |
| 1896..... | 1,125,000   | 22,497        | 146,000                                     | 9,006                                   | 1,063                   | 150                     | 163                        | 333                  | 2,245                    |
| 1897..... | 1,160,000   | 20,674        | 130,500                                     | 8,252                                   | 795                     | 187                     | 173                        | 190                  | 2,164                    |
| 1898..... | 1,197,100   | 21,856        | 134,793                                     | 8,414                                   | 742                     | 159                     | 267                        | 193                  | 2,384                    |
| 1899..... | 1,231,548   | 21,649        | .....                                       | 8,072                                   | 583                     | 175                     | 205                        | 197                  | 2,435                    |
| 1900..... | 1,169,796   | 23,057        | <sup>1</sup> 131,719                        | 8,776                                   | 673                     | 130                     | 301                        | 310                  | 2,445                    |

<sup>1</sup> Estimated.

## St. Louis.

| YEARS.    | Population. | Total Deaths. | Deaths of<br>Children<br>under 5 yrs.<br>of age. | Deaths from<br>Diphtheria.         | Deaths from<br>Scarlet<br>Fever. | Deaths from<br>Typhoid<br>Fever. | Deaths from<br>Measles. | Deaths from<br>Consumption. |
|-----------|-------------|---------------|--------------------------------------------------|------------------------------------|----------------------------------|----------------------------------|-------------------------|-----------------------------|
| 1885..... | 400,000     | 7,490         | 3,090                                            | <i>Diph. — Croup.</i><br>372 — 109 | 164                              | 125                              | 54                      | 888                         |
| 1886..... | 400,000     | 8,268         | 3,484                                            | 719 — 160                          | 149                              | 124                              | 6                       | 915                         |
| 1887..... | 420,000     | 9,155         | 3,795                                            | 927 — 185                          | 48                               | 116                              | 40                      | 829                         |
| 1888..... | 440,000     | 9,015         | 3,659                                            | 564 — 167                          | 30                               | 130                              | 31                      | 800                         |
| 1889..... | 450,000     | 8,004         | 3,149                                            | 345 — 94                           | 114                              | 146                              | 63                      | 655                         |
| 1890..... | 460,000     | 8,409         | 3,115                                            | 186 — 58                           | 87                               | 140                              | 1                       | 843                         |
| 1891..... | 480,000     | 9,530         | 3,493                                            | 250 — 90                           | 96                               | 165                              | 53                      | 869                         |
| 1892..... | 500,000     | 10,225        | 3,607                                            | 195 — 91                           | 150                              | 441                              | 7                       | 882                         |
| 1893..... | 520,000     | 10,303        | 3,548                                            | 227 — 144                          | 79                               | 215                              | 26                      | 984                         |
| 1894..... | 540,000     | 8,710         | 3,192                                            | 240 — 139                          | 29                               | 171                              | 3                       | 875                         |
| 1895..... | 560,000     | 9,425         | 3,373                                            | 512 — 171                          | 18                               | 107                              | 38                      | 1,000                       |
| 1896..... | 570,000     | 9,897         | 3,326                                            | 273 — ....                         | 11                               | 108                              | 17                      | 1,026                       |
| 1897..... | 600,000     | 9,554         | 2,799                                            | 170 — 70                           | 19                               | 123                              | 1                       | 997                         |
| 1898..... | 623,000     | 8,908         | 3,358                                            | 152 — 51                           | 28                               | 95                               | 21                      | 1,001                       |
| 1899..... | 640,000     | 10,024        | 3,005                                            | 192 — ....                         | 34                               | 131                              | 15                      | 1,091                       |
| 1900..... | 575,200     | 9,849         | .....                                            | 344 — 64                           | 57                               | 148                              | 45                      | 1,006                       |

## London, England.

| YEARS.    | Population. | Total Deaths. | Population of Children under 5 years of age. | Deaths of Children under 5 years of age. | Deaths from Diphtheria. | Deaths from Scarlatina. | Deaths from Typhoid Fever. | Deaths from Measles. |
|-----------|-------------|---------------|----------------------------------------------|------------------------------------------|-------------------------|-------------------------|----------------------------|----------------------|
| 1880..... | 3,771,139   | 81,832        | .....                                        | 36,220                                   | 544                     | 8,100                   | 702                        | 1,521                |
| 1881..... | 3,824,960   | 81,071        | 497,044                                      | 33,325                                   | 664                     | 2,108                   | 977                        | 2,533                |
| 1882..... | 3,861,876   | 82,905        | .....                                        | 36,259                                   | 963                     | 2,004                   | 975                        | 2,329                |
| 1883..... | 3,901,164   | 80,578        | .....                                        | 33,552                                   | 951                     | 1,989                   | 985                        | 2,420                |
| 1884..... | 3,939,832   | 83,050        | .....                                        | 36,030                                   | 973                     | 1,444                   | 936                        | 2,285                |
| 1885..... | 3,973,883   | 80,000        | .....                                        | 32,913                                   | 896                     | 707                     | 585                        | 2,928                |
| 1886..... | 4,018,321   | 82,276        | .....                                        | 34,319                                   | 846                     | 688                     | 618                        | 2,078                |
| 1887..... | 4,068,150   | 82,304        | .....                                        | 35,236                                   | 953                     | 1,419                   | 612                        | 2,904                |
| 1888..... | 4,098,374   | 79,099        | .....                                        | 32,669                                   | 1,311                   | 1,190                   | 694                        | 2,425                |
| 1889..... | 4,138,996   | 76,026        | .....                                        | 30,469                                   | 1,616                   | 771                     | 528                        | 2,308                |
| 1890..... | 4,180,021   | 89,554        | .....                                        | 36,123                                   | 1,417                   | 876                     | 618                        | 3,291                |
| 1891..... | 4,221,452   | 90,216        | 501,558                                      | 33,340                                   | 1,361                   | 589                     | 547                        | 1,807                |
| 1892..... | 4,263,294   | 87,749        | .....                                        | 34,560                                   | 1,885                   | 1,174                   | 496                        | 3,393                |
| 1893..... | 4,306,411   | 91,536        | .....                                        | 35,200                                   | 3,265                   | 1,596                   | 719                        | 1,661                |
| 1894..... | 4,349,166   | 77,039        | .....                                        | 31,366                                   | 2,670                   | 962                     | 635                        | 3,298                |
| 1895..... | 4,392,346   | 86,937        | .....                                        | 35,095                                   | 2,316                   | 829                     | 614                        | 2,633                |
| 1896..... | 4,421,955   | 83,511        | .....                                        | 35,599                                   | 2,683                   | 942                     | 591                        | 3,697                |
| 1897..... | 4,463,169   | 80,944        | .....                                        | 32,238                                   | 2,263                   | 781                     | 593                        | 1,928                |
| 1898..... | 4,504,766   | 83,936        | 536,522                                      | 34,184                                   | 1,772                   | 583                     | 585                        | 3,075                |
| 1899..... | 4,506,752   | 89,689        | 541,523                                      | 32,073                                   | 1,964                   | 398                     | 801                        | 1,143                |
| 1900..... | 4,589,129   | 86,007        | 546,570                                      | 30,979                                   | 1,558                   | 361                     | 756                        | 1,936                |

## Paris, France.

| YEARS.                      | Population. | Total Deaths. | Population of Children under 5 years of age. <sup>1</sup> | Deaths of Children under 5 years of age. | Deaths from Diphtheria. | Deaths from Scarlatina. | Deaths from Typhoid Fever. | Deaths from Measles. |
|-----------------------------|-------------|---------------|-----------------------------------------------------------|------------------------------------------|-------------------------|-------------------------|----------------------------|----------------------|
| 1880.....                   | .....       | 55,706        | .....                                                     | 17,674                                   | 2,048                   | 345                     | 2,003                      | 962                  |
| 1881.....                   | 2,239,938   | 55,103        | 148,601                                                   | 17,159                                   | 2,211                   | 440                     | 1,955                      | 897                  |
| 1882.....                   | .....       | 56,854        | .....                                                     | 17,158                                   | 2,244                   | 156                     | 3,214                      | 1,005                |
| 1883.....                   | .....       | 54,763        | .....                                                     | 16,843                                   | 1,781                   | 88                      | 1,880                      | 1,043                |
| 1884.....                   | .....       | 55,059        | .....                                                     | 16,968                                   | 1,928                   | 155                     | 1,503                      | 1,501                |
| 1885.....                   | .....       | 52,726        | .....                                                     | 15,244                                   | 1,655                   | 191                     | 1,320                      | 1,524                |
| 1886.....                   | 2,260,945   | 55,110        | 146,177                                                   | 16,493                                   | 1,512                   | 403                     | 954                        | 1,210                |
| 1887.....                   | .....       | 52,836        | .....                                                     | 15,206                                   | 1,585                   | 224                     | 1,385                      | 1,628                |
| 1888.....                   | .....       | 51,230        | .....                                                     | 14,463                                   | 1,729                   | 193                     | 756                        | 915                  |
| 1889.....                   | .....       | 54,083        | .....                                                     | 14,679                                   | 1,706                   | 170                     | 1,008                      | 1,190                |
| 1890.....                   | .....       | 54,566        | 150,490                                                   | 15,068                                   | 1,668                   | 223                     | 665                        | 1,495                |
| Census of 12th April, 1891. | 2,424,705   |               |                                                           |                                          |                         |                         |                            |                      |
| 1891.....                   | 2,424,705   | 54,443        | 150,490                                                   | 14,048                                   | 1,531                   | 208                     | 549                        | 1,020                |
| 1892.....                   | 2,424,705   | 54,536        | 150,490                                                   | 14,353                                   | 1,403                   | 198                     | 691                        | 999                  |
| 1893.....                   | 2,424,705   | 52,955        | .....                                                     | 13,046                                   | 1,266                   | 177                     | 570                        | 677                  |
| 1894.....                   | 2,424,705   | 249,205       | 150,490                                                   | 11,901                                   | 1,009                   | 151                     | 697                        | 993                  |
| 1895.....                   | 2,424,705   | 51,461        | .....                                                     | .....                                    | 421                     | 179                     | 274                        | 682                  |
| 1896.....                   | 2,511,629   | 47,929        | 188,941                                                   | 10,363                                   | 444                     | 190                     | 262                        | 656                  |
| 1897.....                   | 2,511,629   | 46,988        | 156,494                                                   | 10,528                                   | 298                     | 65                      | 249                        | 821                  |
| 1898.....                   | 2,511,629   | 49,574        | 156,494                                                   | 11,671                                   | 259                     | 138                     | 256                        | 876                  |
| 1899.....                   | 2,511,629   | 50,511        | .....                                                     | .....                                    | 336                     | 196                     | 754                        | 901                  |
| 1900.....                   | .....       | .....         | .....                                                     | .....                                    | .....                   | .....                   | .....                      | .....                |

<sup>1</sup> Estimated, 1891.<sup>2</sup> Inhabitants of Paris only.

## Berlin, Germany.

| YEARS.        | Population. | Total Deaths. <sup>1</sup> | Population of Children under 5 years of age. | Deaths of Children under 5 years of age. | Deaths from Diphtheria. | Deaths from Scarlatina. | Deaths from Typhoid Fever. | Deaths from Measles. |
|---------------|-------------|----------------------------|----------------------------------------------|------------------------------------------|-------------------------|-------------------------|----------------------------|----------------------|
| Beginning.... | 1,089,070   | .....                      | 142,476                                      |                                          |                         |                         |                            |                      |
| 1880.....     | .....       | 32,823                     | .....                                        | 19,249                                   | 1,198                   | 872                     | 527                        | 376                  |
| End.....      | 1,123,749   | .....                      | 183,060                                      |                                          |                         |                         |                            |                      |
| 1881.....     | .....       | 31,055                     | .....                                        | 17,483                                   | 1,593                   | 903                     | 352                        | 201                  |
| End.....      | 1,158,559   | .....                      | 143,828                                      |                                          |                         |                         |                            |                      |
| 1882.....     | .....       | 30,465                     | .....                                        | 16,990                                   | 1,914                   | 604                     | 357                        | 144                  |
| End.....      | 1,196,205   | .....                      | 146,138                                      |                                          |                         |                         |                            |                      |
| 1883.....     | .....       | 35,056                     | .....                                        | 19,902                                   | 2,651                   | 867                     | 222                        | 1,173                |
| End.....      | 1,232,716   | .....                      | 144,464                                      |                                          |                         |                         |                            |                      |
| 1884.....     | .....       | 32,932                     | .....                                        | 18,440                                   | 2,446                   | 395                     | 243                        | 295                  |
| End.....      | 1,271,677   | .....                      | 144,620                                      |                                          |                         |                         |                            |                      |
| 1885.....     | .....       | 31,483                     | .....                                        | 15,558                                   | 1,816                   | 409                     | 214                        | 406                  |
| End.....      | 1,315,656   | .....                      | 146,227                                      |                                          |                         |                         |                            |                      |
| 1886.....     | .....       | 34,293                     | .....                                        | 19,215                                   | 1,535                   | 271                     | 181                        | 565                  |
| End.....      | 1,363,031   | .....                      |                                              |                                          |                         |                         |                            |                      |
| 1887.....     | .....       | 30,336                     | .....                                        | 15,777                                   | 1,305                   | 257                     | 193                        | 223                  |
| End.....      | 1,415,269   | .....                      |                                              |                                          |                         |                         |                            |                      |
| 1888.....     | .....       | 29,298                     | .....                                        | 15,076                                   | 1,018                   | 201                     | 188                        | 364                  |
| End.....      | 1,472,151   | .....                      |                                              |                                          |                         |                         |                            |                      |
| 1889.....     | .....       | 34,460                     | .....                                        | 18,394                                   | 1,189                   | 244                     | 290                        | 201                  |
| End.....      | 1,528,721   | .....                      |                                              |                                          |                         |                         |                            |                      |
| 1890.....     | .....       | 33,393                     | .....                                        | 17,630                                   | 1,492                   | 298                     | 143                        | 441                  |
| End.....      | 1,579,524   | .....                      | 2164,370                                     |                                          |                         |                         |                            |                      |
| 1891.....     | 1,601,327   | .....                      | .....                                        | 16,800                                   | 1,010                   | 150                     | 166                        | 130                  |
| 1892.....     | 1,656,715   | 32,696                     | 172,378                                      | 16,319                                   | 1,325                   | 53                      | 137                        | 217                  |
| 1893.....     | 1,714,938   | 36,032                     | .....                                        | .....                                    | 1,578                   | 582                     | 161                        | 341                  |
| 1894.....     | 1,655,235   | 30,961                     | 176,200                                      | 14,649                                   | 1,361                   | 443                     | 69                         | 203                  |
| 1895.....     | 1,677,304   | 33,627                     | 164,258                                      | 16,034                                   | 984                     | 817                     | 95                         | 175                  |
| 1896.....     | 1,695,313   | 30,578                     | .....                                        | 13,443                                   | 515                     | 333                     | 80                         | 111                  |
| 1897.....     | 1,758,885   | 30,622                     | 58,339                                       | 13,825                                   | 507                     | 217                     | 71                         | 161                  |
| 1898.....     | 1,805,064   | 30,671                     | 56,751                                       | 13,595                                   | 608                     | 268                     | 78                         | 119                  |
| 1899.....     | 1,817,952   | 34,011                     | 166,888                                      | 14,878                                   | 609                     | 525                     | 74                         | 530                  |
| 1900.....     | 1,864,203   | 35,409                     | .....                                        | 15,498                                   | 534                     | 502                     | 109                        | 195                  |

<sup>1</sup> Census of December 1, 1890.<sup>2</sup> Excluded: Still-born, 1,749, 1,771, 1,759, 1,707, 1,778, 1,848, 1,710, 1,761, 1,756, 1,789, 1,473.

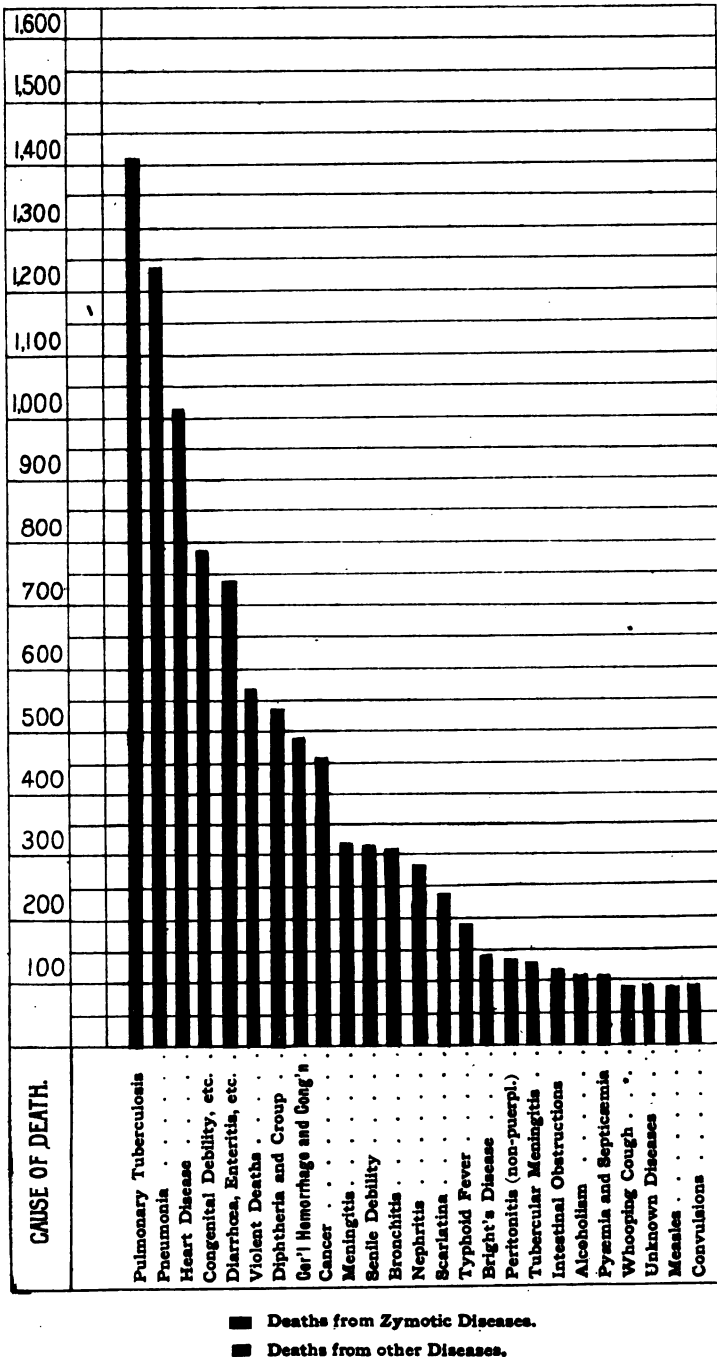
## Vienna, Austria.

| YEARS.     | Population. | Total Deaths. | Population of Children under 5 years of age. | Deaths of Children under 5 years of age. | Deaths from Diphtheria and Croup. | Deaths from Scarlatina. | Deaths from Typhoid Fever. | Deaths from Measles. |
|------------|-------------|---------------|----------------------------------------------|------------------------------------------|-----------------------------------|-------------------------|----------------------------|----------------------|
| 1880 ..... | 721,016     | 20,453        | 58,023                                       | 8,219                                    | 597                               | 172                     | 171                        | 98                   |
| 1881 ..... | 731,208     | 21,549        | .....                                        | 8,224                                    | 539                               | 286                     | 171                        | 106                  |
| 1882 ..... | 740,919     | 21,595        | .....                                        | 8,908                                    | 522                               | 410                     | 187                        | 203                  |
| 1883 ..... | 750,762     | 21,194        | .....                                        | 7,980                                    | 360                               | 150                     | 157                        | 246                  |
| 1884 ..... | 759,849     | 20,353        | .....                                        | 7,688                                    | 342                               | 130                     | 95                         | 344                  |
| 1885 ..... | 769,889     | 21,976        | .....                                        | 8,668                                    | 464                               | 83                      | 106                        | 289                  |
| 1886 ..... | 780,066     | 20,869        | .....                                        | 8,114                                    | 546                               | 124                     | 85                         | 338                  |
| 1887 ..... | 790,381     | 20,549        | .....                                        | 7,912                                    | 455                               | 391                     | 80                         | 493                  |
| 1888 ..... | 800,886     | 20,349        | .....                                        | 7,547                                    | 521                               | 230                     | 107                        | 253                  |
| 1889 ..... | 811,434     | 20,106        | .....                                        | 7,624                                    | 513                               | 139                     | 103                        | 364                  |
| 1890 ..... | 822,176     | 20,324        | 69,710                                       | 7,853                                    | 536                               | 92                      | 77                         | 459                  |
| 1891 ..... | 1,378,530   | 34,479        | 130,808                                      | 15,610                                   | 1,311                             | 271                     | 85                         | 855                  |
| 1892 ..... | 1,406,933   | 35,134        | .....                                        | 16,843                                   | 1,580                             | 242                     | 116                        | 825                  |
| 1893 ..... | 1,435,931   | 34,515        | 130,808                                      | 15,002                                   | 1,615                             | 311                     | 105                        | 1,225                |
| 1894 ..... | 1,465,637   | 33,944        | 140,545                                      | 15,073                                   | 1,679                             | 413                     | 74                         | 896                  |
| 1895 ..... | 1,495,764   | 34,879        | .....                                        | 15,021                                   | 710                               | 437                     | 86                         | 754                  |
| 1896 ..... | 1,526,623   | 34,132        | .....                                        | 14,685                                   | 621                               | 436                     | 79                         | 960                  |
| 1897 ..... | 1,551,129   | 33,187        | .....                                        | 13,946                                   | 575                               | 236                     | 84                         | 857                  |
| 1898 ..... | 1,590,295   | 32,356        | .....                                        | 13,593                                   | 520                               | 227                     | 93                         | 794                  |
| 1899 ..... | 1,623,134   | 33,333        | .....                                        | .....                                    | 463                               | 261                     | 66                         | 684                  |
| 1900 ..... | .....       | .....         | .....                                        | .....                                    | .....                             | .....                   | .....                      | .....                |



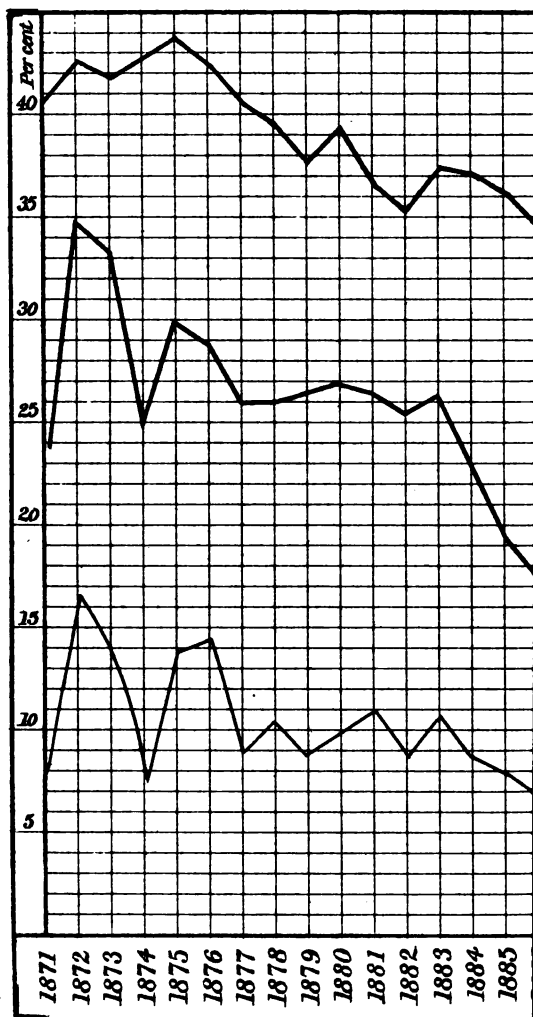
# CHART NO. 1.

## Comparative View of Twenty-five of the Principal Causes of Death during the Year 1900.





**CHART**  
**Percentage of Deaths of Children**  
**ZYMOTIC DEATHS, AND FIVE OF THE**  
**to the total mortality for thirty**



Percentage of Children under five years of age  
 " of Zymotic deaths to total mortality  
 " of Diphtheria, Scarlet Fever, and Small-Pox to total mortality

The increased number of deaths in the Zymotic group, due to the incorporation into this group, Paludism, with some forms of Diarrhoeal Diseases.

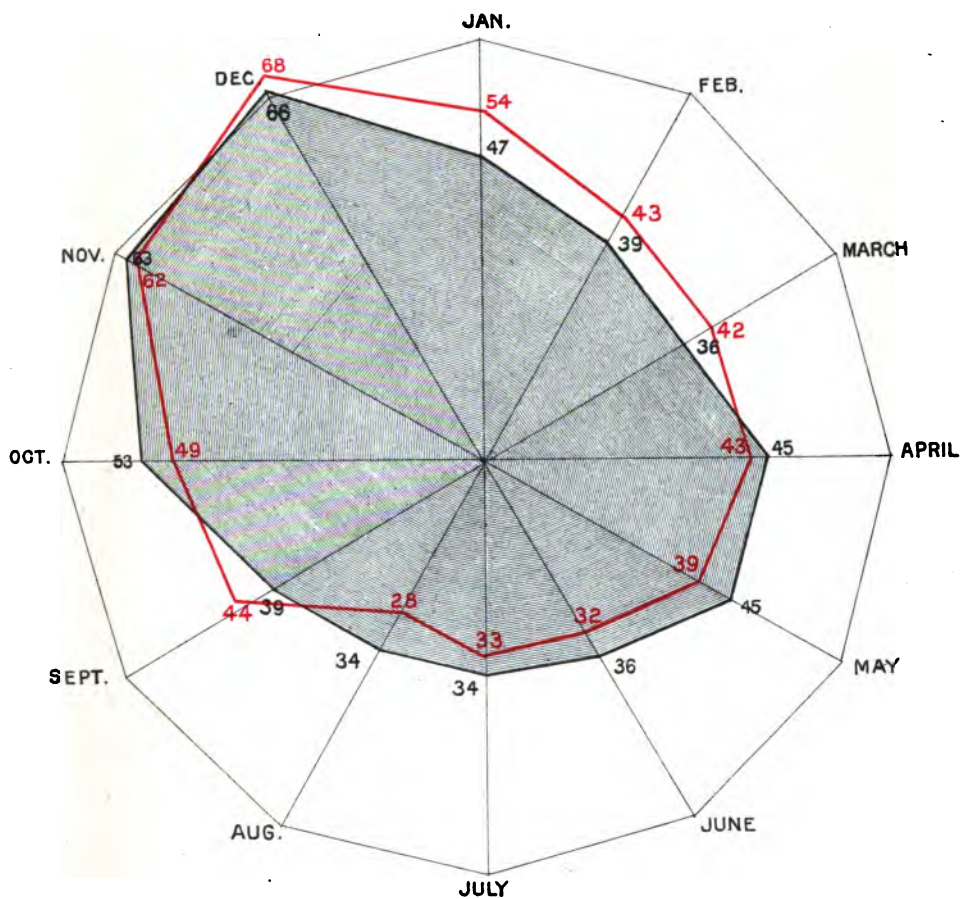






# CHART NO. 4.

## DIPHTHERIA AND CROUP.



— Average deaths per month for ten years, 1891-1900.  
 — Deaths per month for the year 1900.





## Glasgow, Scotland.

| YEARS.         | Population. | Total Deaths. | Population of Children under 5 years of age. | Deaths of Children under 5 years of age. | Deaths from Diphtheria. | Deaths from Scarlatina. | Deaths from Typhoid Fever. | Deaths from Measles. |
|----------------|-------------|---------------|----------------------------------------------|------------------------------------------|-------------------------|-------------------------|----------------------------|----------------------|
| 1880 .....     | .....       | 13,303        | .....                                        | 6,071                                    | 150                     | 453                     | 278                        | 331                  |
| 1881 census... | 511,415     | 12,909        | 69,931                                       | 5,386                                    | 162                     | 256                     | 166                        | 333                  |
| 1882 .....     | .....       | 12,985        | .....                                        | 5,972                                    | 177                     | 263                     | 162                        | 213                  |
| 1883 .....     | .....       | 14,476        | .....                                        | 6,494                                    | 132                     | 449                     | 167                        | 605                  |
| 1884 .....     | .....       | 13,839        | .....                                        | 6,174                                    | 157                     | 412                     | 184                        | 335                  |
| 1885 .....     | .....       | 13,444        | .....                                        | 6,156                                    | 112                     | 288                     | 102                        | 430                  |
| 1886 .....     | .....       | 13,053        | .....                                        | 5,601                                    | 111                     | 345                     | 81                         | 90                   |
| 1887 .....     | .....       | 12,055        | .....                                        | 5,367                                    | 174                     | 234                     | 100                        | 302                  |
| 1888 .....     | .....       | 11,533        | .....                                        | 4,743                                    | 168                     | 163                     | 69                         | 205                  |
| 1889 .....     | .....       | 12,890        | .....                                        | 5,970                                    | 167                     | 109                     | 111                        | 594                  |
| 1890 .....     | .....       | 13,222        | .....                                        | 5,768                                    | 139                     | 124                     | 108                        | 583                  |
| 1891 census... | 565,710     | 14,149        | 72,481                                       | 5,432                                    | 131                     | 201                     | 123                        | 400                  |
| 1892 .....     | 669,069     | 15,128        | 84,860                                       | 6,306                                    | 162                     | 304                     | 102                        | 781                  |
| 1893 .....     | 677,863     | 15,798        | 85,968                                       | 6,953                                    | 208                     | 263                     | 120                        | 855                  |
| 1894 .....     | 686,820     | 13,674        | 87,103                                       | 5,326                                    | 245                     | 204                     | 150                        | 250                  |
| 1895 .....     | 695,876     | 16,332        | 88,250                                       | 6,458                                    | 112                     | 180                     | 121                        | 330                  |
| 1896 .....     | 705,062     | 14,398        | 89,413                                       | 6,153                                    | 83                      | 139                     | 139                        | 814                  |
| 1897 .....     | 714,419     | 15,727        | 90,665                                       | 6,750                                    | 97                      | 132                     | 172                        | 574                  |
| 1898 .....     | 724,349     | 15,333        | 91,861                                       | 6,530                                    | 103                     | 188                     | 223                        | 536                  |
| 1899 .....     | 733,903     | 15,828        | 93,073                                       | 6,196                                    | 106                     | 202                     | 179                        | 546                  |
| 1900 .....     | .....       | .....         | .....                                        | .....                                    | .....                   | .....                   | .....                      | .....                |

**Liverpool, England.**

| YEARS.     | Population. | Total Deaths. | Population of Children under 5 years of age. | Deaths of Children under 5 years of age. | Deaths from Diphtheria. | Deaths from Scarlatina. | Deaths from Typhoid Fever. | Deaths from Measles. |
|------------|-------------|---------------|----------------------------------------------|------------------------------------------|-------------------------|-------------------------|----------------------------|----------------------|
| 1884 ..... | 541,031     | 14,382        | .....                                        | 6,908                                    | 80                      | 197                     | 112                        | 611                  |
| 1885 ..... | 537,548     | 13,764        | .....                                        | 6,213                                    | 133                     | 190                     | 95                         | 716                  |
| 1886 ..... | 534,088     | 13,919        | .....                                        | 6,152                                    | 125                     | 277                     | 140                        | 273                  |
| 1887 ..... | 580,649     | 14,006        | .....                                        | 6,218                                    | 96                      | 321                     | 130                        | 661                  |
| 1888 ..... | 527,233     | 12,159        | .....                                        | 5,070                                    | 66                      | 187                     | 125                        | 331                  |
| 1889 ..... | 523,838     | 13,047        | .....                                        | 5,921                                    | 57                      | 352                     | 167                        | 485                  |
| 1890 ..... | 520,466     | 14,298        | .....                                        | 6,319                                    | 104                     | 577                     | 99                         | 535                  |
| 1891 ..... | 517,145     | 13,911        | .....                                        | 5,697                                    | 63                      | 119                     | 92                         | 320                  |
| 1892 ..... | 513,818     | 12,671        | .....                                        | 5,322                                    | 47                      | 181                     | 111                        | 456                  |
| 1893 ..... | 510,514     | 13,919        | .....                                        | 6,085                                    | 47                      | 231                     | 221                        | 273                  |
| 1894 ..... | 507,230     | 12,073        | 64,544                                       | 5,214                                    | 65                      | 232                     | 248                        | 299                  |
| 1895 ..... | 638,291     | 16,215        | 78,411                                       | 7,201                                    | 97                      | 168                     | 192                        | 397                  |
| 1896 ..... | 682,512     | 14,617        | .....                                        | .....                                    | 157                     | 227                     | 206                        | 306                  |
| 1897 ..... | 644,129     | 15,590        | 78,411                                       | 6,972                                    | 91                      | 209                     | 145                        | 344                  |
| 1898 ..... | 668,645     | 15,380        | .....                                        | 6,489                                    | 123                     | 145                     | 148                        | 283                  |
| 1899 ..... | 668,645     | 16,269        | 83,042                                       | 7,039                                    | 189                     | 164                     | 174                        | 320                  |
| 1900 ..... | 668,645     | 16,393        | 83,042                                       | 6,417                                    | 143                     | 113                     | 120                        | 150                  |

**Table I. — Total of Deaths, Still-births and Deaths from Zymotic Diseases, for Thirty years, with Percentages.**

| YEARS.     | Total Deaths,<br>exclusive of<br>still-births. | Still-births. | Total Zymot-<br>ics. | Diphtheria<br>and Croup. | Scarlet Fever. | Typhoid<br>Fever. | Cerebro-spinal<br>Meningitis. | Whooping<br>cough. | Measles. | Diarrheal<br>Diseases. | Small-pox. | Percentage of<br>Zymotic<br>Deaths to to-<br>tal Mortality. | Rates of Still-<br>births per<br>1,000 Inhab-<br>itants. |
|------------|------------------------------------------------|---------------|----------------------|--------------------------|----------------|-------------------|-------------------------------|--------------------|----------|------------------------|------------|-------------------------------------------------------------|----------------------------------------------------------|
| 1871 ..... | 5,888                                          | 543           | 1,408                | 128                      | 111            | 176               | 3                             | 30                 | 9        | 756                    | 23         | 23.91                                                       | 1.88                                                     |
| 1872 ..... | 8,090                                          | 560           | 2,823                | 94                       | 258            | 229               | 60                            | 52                 | 60       | 1,006                  | 738        | 34.89                                                       | 1.91                                                     |
| 1873 ..... | 7,869                                          | 515           | 2,626                | 119                      | 474            | 243               | 216                           | 33                 | 16       | 925                    | 302        | 33.37                                                       | 1.76                                                     |
| 1874 ..... | 7,812                                          | 642           | 1,899                | 121                      | 269            | 202               | 35                            | 108                | 41       | 940                    | 2          | 24.30                                                       | 2.19                                                     |
| 1875 ..... | 9,060                                          | 541           | 2,722                | 631                      | 534            | 227               | 41                            | 41                 | 65       | 989                    | 1          | 30.02                                                       | 1.28                                                     |
| 1876 ..... | 8,253                                          | 485           | 2,439                | 720                      | 458            | 145               | 13                            | 59                 | 2        | 827                    | 2          | 29.55                                                       | 1.41                                                     |
| 1877 ..... | 7,516                                          | 471           | 1,890                | 471                      | 104            | 156               | 24                            | 88                 | 2        | 913                    | 4          | 25.83                                                       | 1.37                                                     |
| 1878 ..... | 7,636                                          | 441           | 1,980                | 569                      | 68             | 120               | 19                            | 88                 | 145      | 816                    | ....       | 25.91                                                       | 1.28                                                     |
| 1879 ..... | 7,398                                          | 453           | 1,935                | 545                      | 149            | 119               | 15                            | 112                | 2        | 772                    | ....       | 26.15                                                       | 1.24                                                     |
| 1880 ..... | 8,531                                          | 443           | 2,321                | 774                      | 33             | 154               | 8                             | 94                 | 49       | 1,003                  | 1          | 27.20                                                       | 1.22                                                     |
| 1881 ..... | 9,016                                          | 513           | 2,423                | 802                      | 35             | 207               | 16                            | 77                 | 108      | 870                    | 6          | 26.87                                                       | 1.29                                                     |
| 1882 ..... | 8,995                                          | 518           | 2,276                | 575                      | 75             | 212               | 24                            | 92                 | 25       | 951                    | 8          | 25.30                                                       | 1.26                                                     |
| 1883 ..... | 9,740                                          | 504           | 2,551                | 608                      | 211            | 198               | 23                            | 31                 | 152      | 1,023                  | 1          | 26.19                                                       | 1.17                                                     |
| 1884 ..... | 9,622                                          | 503           | 2,278                | 487                      | 209            | 216               | 26                            | 181                | 13       | 855                    | 1          | 23.67                                                       | 1.17                                                     |
| 1885 ..... | 9,618                                          | 520           | 1,879                | 450                      | 156            | 152               | 19                            | 26                 | 84       | 723                    | 2          | 19.53                                                       | 1.30                                                     |
| 1886 ..... | 9,268                                          | 543           | 1,644                | 423                      | 81             | 135               | 14                            | 37                 | 36       | 705                    | ....       | 17.73                                                       | 1.35                                                     |
| 1887 ..... | 10,073                                         | 534           | 1,993                | 410                      | 195            | 183               | 16                            | 82                 | 119      | 734                    | ....       | 19.70                                                       | 1.33                                                     |
| 1888 ..... | 10,197                                         | 552           | 1,841                | 589                      | 65             | 170               | 19                            | 74                 | 27       | 669                    | 2          | 18.05                                                       | 1.33                                                     |
| 1889 ..... | 10,259                                         | 598           | 1,968                | 683                      | 23             | 186               | 21                            | 96                 | 48       | 710                    | 2          | 19.18                                                       | 1.42                                                     |
| 1890 ..... | 10,181                                         | 627           | 1,677                | 462                      | 42             | 155               | 17                            | 39                 | 19       | 665                    | ....       | 16.47                                                       | 1.39                                                     |
| 1891 ..... | 10,571                                         | 614           | 1,615                | 285                      | 64             | 154               | 21                            | 39                 | 21       | 755                    | ....       | 15.27                                                       | 1.33                                                     |
| 1892 ..... | 11,236                                         | 633           | 2,014                | 481                      | 262            | 137               | 12                            | 45                 | 19       | 693                    | ....       | 17.92                                                       | 1.34                                                     |
| 1893 ..... | 11,710                                         | 605           | 2,042                | 546                      | 248            | 148               | 15                            | 40                 | 27       | 635                    | ....       | 17.43                                                       | 1.24                                                     |
| 1894 ..... | 11,520                                         | 700           | 2,357                | 878                      | 192            | 141               | 18                            | 111                | 8        | 700                    | 22         | 20.46                                                       | 1.39                                                     |
| 1895 ..... | 11,329                                         | 607           | 1,968                | 654                      | 114            | 163               | 15                            | 47                 | 19       | 627                    | ....       | 17.37                                                       | 1.21                                                     |
| 1896 ..... | 11,634                                         | 648           | 1,985                | 572                      | 112            | 162               | 21                            | 67                 | 27       | 713                    | ....       | 17.06                                                       | 1.25                                                     |
| 1897 ..... | 11,154                                         | 614           | 1,806                | 456                      | 136            | 173               | 185                           | 39                 | 21       | 522                    | ....       | 16.19                                                       | 1.16                                                     |
| 1898 ..... | 10,886                                         | 613           | 1,470                | 185                      | 33             | 185               | 97                            | 68                 | 27       | 599                    | ...        | 13.50                                                       | 1.13                                                     |
| 1899 ..... | 11,167                                         | 539           | 1,444                | 304                      | 74             | 165               | 88                            | 76                 | 33       | 396                    | 5          | 12.93                                                       | .97                                                      |
| 1900 ..... | 11,678                                         | 573           | 3,787                | 537                      | 181            | 143               | 66                            | 99                 | 89       | 740                    | ....       | 32.43                                                       | 1.02                                                     |

**Table II. — Total Number of Deaths under Five Years, and Five Years and over, for Thirty Years, with Percentages to the Total Mortality.**

| YEARS.    | Total Deaths. | Five Years and over. | Under Five Years. | PERCENTAGES.         |                   |
|-----------|---------------|----------------------|-------------------|----------------------|-------------------|
|           |               |                      |                   | Five Years and over. | Under Five Years. |
| 1871..... | 5,888         | 3,498                | 2,396             | 59.33                | 40.67             |
| 1872..... | 8,090         | 4,676                | 3,414             | 57.79                | 42.21             |
| 1873..... | 7,969         | 4,580                | 3,289             | 58.20                | 41.80             |
| 1874..... | 7,812         | 4,454                | 3,358             | 57.01                | 42.99             |
| 1875..... | 9,060         | 5,088                | 3,972             | 56.16                | 43.84             |
| 1876..... | 8,253         | 4,722                | 3,531             | 57.22                | 42.78             |
| 1877..... | 7,316         | 4,334                | 2,982             | 59.24                | 40.76             |
| 1878..... | 7,636         | 4,630                | 3,006             | 60.63                | 39.37             |
| 1879..... | 7,398         | 4,593                | 2,805             | 62.08                | 37.92             |
| 1880..... | 8,531         | 5,182                | 3,349             | 60.74                | 39.26             |
| 1881..... | 9,016         | 5,702                | 3,314             | 63.24                | 36.76             |
| 1882..... | 8,995         | 5,844                | 3,151             | 64.97                | 35.03             |
| 1883..... | 9,740         | 6,113                | 3,627             | 62.76                | 37.24             |
| 1884..... | 9,622         | 6,052                | 3,570             | 62.90                | 37.10             |
| 1885..... | 9,618         | 6,132                | 3,486             | 63.97                | 36.03             |
| 1886..... | 9,268         | 6,082                | 3,186             | 65.63                | 34.37             |
| 1887..... | 10,073        | 6,411                | 3,662             | 63.55                | 36.35             |
| 1888..... | 10,197        | 6,598                | 3,599             | 64.71                | 35.29             |
| 1889..... | 10,259        | 6,626                | 3,633             | 64.59                | 35.41             |
| 1890..... | 10,181        | 6,832                | 3,349             | 67.11                | 32.89             |
| 1891..... | 10,571        | 6,963                | 3,608             | 65.87                | 34.13             |
| 1892..... | 11,236        | 7,501                | 3,735             | 66.76                | 33.24             |
| 1893..... | 11,710        | 7,723                | 3,987             | 65.96                | 34.04             |
| 1894..... | 11,520        | 7,412                | 4,108             | 64.34                | 35.66             |
| 1895..... | 11,329        | 7,394                | 3,935             | 65.27                | 34.73             |
| 1896..... | 11,634        | 7,579                | 4,055             | 65.15                | 34.85             |
| 1897..... | 11,154        | 7,446                | 3,708             | 66.76                | 33.24             |
| 1898..... | 10,886        | 7,309                | 3,577             | 67.14                | 32.86             |
| 1899..... | 11,167        | 7,576                | 3,591             | 67.84                | 32.16             |
| 1900..... | 11,678        | 7,926                | 3,752             | 67.87                | 32.13             |

Table III.—Deaths during the Year 1900, by Sex, Condition, Color, Nativity, Parentage, and Season.

|                                    | January. | February. | March. | April. | May.  | June. | July. | August. | September. | October. | November. | December. | Total. |
|------------------------------------|----------|-----------|--------|--------|-------|-------|-------|---------|------------|----------|-----------|-----------|--------|
| <b>Total number of deaths.....</b> | 1,001    | 933       | 1,434  | 1,047  | 945   | 786   | 1,024 | 999     | 883        | 892      | 889       | 895       | 11,678 |
| <b>Sex:</b>                        |          |           |        |        |       |       |       |         |            |          |           |           |        |
| Males.....                         | 484      | 478       | 698    | 552    | 504   | 414   | 549   | 530     | 420        | 456      | 420       | 480       | 5,960  |
| Females.....                       | 517      | 455       | 741    | 495    | 441   | 372   | 475   | 469     | 463        | 436      | 419       | 415       | 5,698  |
| <b>Condition:</b>                  |          |           |        |        |       |       |       |         |            |          |           |           |        |
| Single.....                        | 503      | 473       | 689    | 502    | 505   | 427   | 630   | 632     | 532        | 481      | 433       | 452       | 6,319  |
| Married.....                       | 312      | 282       | 431    | 298    | 292   | 221   | 257   | 240     | 212        | 264      | 247       | 301       | 3,357  |
| Widows.....                        | 130      | 129       | 229    | 110    | 96    | 84    | 86    | 83      | 93         | 100      | 92        | 88        | 1,320  |
| Widowers.....                      | 47       | 41        | 79     | 67     | 41    | 42    | 37    | 36      | 41         | 38       | 52        | 46        | 567    |
| Divorced.....                      | 4        | 3         | 4      | 3      | 1     | 2     | 5     | 1       | ....       | 5        | 8         | 1         | 37     |
| Unknown.....                       | 5        | 5         | 2      | 7      | 10    | 10    | 9     | 7       | 5          | 4        | 7         | 7         | 78     |
| <b>Color:</b>                      |          |           |        |        |       |       |       |         |            |          |           |           |        |
| White.....                         | 974      | 911       | 1,390  | 1,020  | 918   | 761   | 991   | 970     | 861        | 865      | 813       | 876       | 11,350 |
| Black (Negro or mixed).....        | 23       | 20        | 41     | 24     | 24    | 20    | 29    | 24      | 18         | 27       | 25        | 17        | 292    |
| Indian.....                        | .....    | .....     | .....  | .....  | ..... | ..... | ..... | .....   | .....      | .....    | .....     | .....     | .....  |
| Chinese.....                       | 3        | 2         | 3      | 3      | 3     | 5     | 4     | 5       | 4          | ....     | 1         | 2         | 35     |
| Japanese.....                      | 1        | .....     | .....  | .....  | ..... | ..... | ..... | .....   | .....      | .....    | .....     | .....     | 1      |
| <b>Nativity:</b>                   |          |           |        |        |       |       |       |         |            |          |           |           |        |
| United States...                   | 625      | 607       | 893    | 640    | 633   | 494   | 706   | 713     | 611        | 595      | 568       | 561       | 7,646  |
| Ireland.....                       | 200      | 155       | 305    | 218    | 142   | 153   | 153   | 142     | 142        | 153      | 143       | 180       | 2,086  |
| England.....                       | 14       | 27        | 23     | 19     | 17    | 15    | 23    | 13      | 15         | 28       | 12        | 13        | 219    |
| Scotland.....                      | 12       | 13        | 9      | 9      | 10    | 3     | 6     | 6       | 4          | 5        | 7         | 5         | 89     |
| Germany.....                       | 15       | 15        | 29     | 29     | 16    | 17    | 20    | 13      | 13         | 13       | 11        | 16        | 207    |
| Br. Provinces..                    | 82       | 57        | 103    | 69     | 61    | 44    | 60    | 61      | 49         | 45       | 61        | 63        | 755    |
| Italy.....                         | 14       | 11        | 21     | 18     | 15    | 12    | 18    | 16      | 10         | 8        | 5         | 20        | 168    |
| Russia.....                        | 15       | 15        | 9      | 11     | 12    | 7     | 11    | 5       | 10         | 15       | 9         | 10        | 129    |
| Sweden.....                        | 3        | 1         | 5      | 6      | 6     | 4     | 6     | 4       | 4          | 8        | 4         | 11        | 62     |
| Other countries,                   | 14       | 17        | 16     | 16     | 18    | 22    | 6     | 14      | 12         | 12       | 4         | 10        | 161    |
| Unknown.....                       | 7        | 15        | 21     | 12     | 15    | 15    | 15    | 12      | 13         | 10       | 15        | 6         | 156    |
| <b>Parentage:</b>                  |          |           |        |        |       |       |       |         |            |          |           |           |        |
| American.....                      | 221      | 233       | 370    | 259    | 247   | 182   | 231   | 251     | 204        | 212      | 198       | 189       | 2,797  |
| Irish.....                         | 360      | 284       | 446    | 318    | 259   | 265   | 307   | 290     | 282        | 288      | 254       | 300       | 3,653  |
| English.....                       | 20       | 22        | 28     | 24     | 16    | 13    | 19    | 15      | 16         | 25       | 19        | 15        | 232    |
| Scotch.....                        | 16       | 11        | 15     | 15     | 13    | 8     | 7     | 6       | 6          | 7        | 15        | 9         | 128    |
| German.....                        | 30       | 21        | 38     | 33     | 23    | 25    | 29    | 21      | 19         | 21       | 22        | 26        | 308    |
| Br. Provinces..                    | 80       | 70        | 75     | 57     | 58    | 54    | 80    | 95      | 57         | 49       | 49        | 55        | 779    |

Table No. III. — Concluded.

|                           | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Total. |
|---------------------------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|--------|
| Italian.....              | 36       | 44        | 52     | 49     | 69   | 43    | 38    | 34      | 27         | 20       | 24        | 39        | 475    |
| Russian.....              | 25       | 28        | 34     | 33     | 24   | 22    | 29    | 24      | 34         | 36       | 23        | 32        | 344    |
| Swedish.....              | 3        | 9         | 8      | 6      | 7    | 4     | 10    | 12      | 5          | 13       | 6         | 8         | 91     |
| Other countries,          | 47       | 52        | 89     | 56     | 66   | 43    | 46    | 58      | 62         | 46       | 54        | 59        | 678    |
| Mixed.....                | 73       | 60        | 91     | 79     | 67   | 50    | 117   | 106     | 84         | 78       | 80        | 64        | 949    |
| <sup>1</sup> Unknown..... | 90       | 99        | 188    | 118    | 96   | 77    | 111   | 87      | 87         | 97       | 95        | 99        | 1,244  |

<sup>1</sup> This includes deaths where one parent is unknown.

Table IV. — Deaths from Principal Zymotic Diseases.

|                                           | Total Deaths from each Cause. | Percentage of each Cause to Total Mortality. | Death per 1,000 Inhabitants. | Total Deaths per Sex. |       | Total Deaths per Sex under Five Years. |       | Total Deaths under Five Years. | Percentage of each Cause under Five Years to Total Mortality. |
|-------------------------------------------|-------------------------------|----------------------------------------------|------------------------------|-----------------------|-------|----------------------------------------|-------|--------------------------------|---------------------------------------------------------------|
|                                           |                               |                                              |                              | M.                    | F.    | M.                                     | F.    |                                |                                                               |
| Small-pox.....                            | .....                         | .....                                        | .....                        | .....                 | ..... | .....                                  | ..... | .....                          | .....                                                         |
| Measles.....                              | 88                            | .753.                                        | .157                         | 43                    | 45    | 43                                     | 44    | 87                             | .745                                                          |
| Scarlatina.....                           | 181                           | 1.549                                        | .323                         | 90                    | 91    | 69                                     | 70    | 139                            | 1.190                                                         |
| Diphtheria and Croup.....                 | 537                           | 4.598                                        | .957                         | 266                   | 271   | 186                                    | 173   | 359                            | 3.074                                                         |
| Whooping-cough.....                       | 99                            | .848                                         | .176                         | 42                    | 57    | 42                                     | 54    | 96                             | .822                                                          |
| Typhoid fever.....                        | 143                           | 1.224                                        | .255                         | 93                    | 50    | 1                                      | 3     | 4                              | .034                                                          |
| Erysipelas.....                           | 53                            | .454                                         | .094                         | 27                    | 26    | 5                                      | 11    | 16                             | .137                                                          |
| Puerperal fever.....                      | 29                            | .248                                         | .052                         | .....                 | 29    | .....                                  | ..... | .....                          | .....                                                         |
| Dysentery.....                            | 6                             | .051                                         | .011                         | 3                     | 3     | 2                                      | ..... | 2                              | .017                                                          |
| Cholera morbus.....                       | 15                            | .128                                         | .027                         | 8                     | 7     | .....                                  | 1     | 1                              | .008                                                          |
| Diarrhea, including Cholera infantum..... | 740                           | 6.337                                        | 1.319                        | 393                   | 347   | 355                                    | 302   | 657                            | 5.626                                                         |
| Phthisis Laryngeal and Pulmonary.....     | 1,407                         | 12.048                                       | 2.508                        | 764                   | 643   | 35                                     | 30    | 65                             | .557                                                          |
| Influenza.....                            | 215                           | 1.841                                        | .383                         | 61                    | 154   | 4                                      | 14    | 18                             | .154                                                          |
| Intermittent fever.....                   | 6                             | .051                                         | .011                         | 3                     | 3     | 2                                      | 2     | 4                              | .034                                                          |
| Rheumatism.....                           | 69                            | .590                                         | .105                         | 32                    | 37    | 2                                      | 2     | 4                              | .034                                                          |
| Syphilis, congenital.....                 | 20                            | .171                                         | .036                         | 14                    | 6     | 14                                     | 6     | 20                             | .171                                                          |
| Syphilis, tertiary.....                   | 10                            | .085                                         | .018                         | 7                     | 3     | .....                                  | ..... | .....                          | .....                                                         |
| Pyemia and Septicemia..                   | 100                           | .856                                         | .178                         | 43                    | 57    | 11                                     | 4     | 5                              | .043                                                          |
| Typhus fever.....                         | .....                         | .....                                        | .....                        | .....                 | ..... | .....                                  | ..... | .....                          | .....                                                         |
| Remittent fever.....                      | .....                         | .....                                        | .....                        | .....                 | ..... | .....                                  | ..... | .....                          | .....                                                         |
| Yellow fever.....                         | .....                         | .....                                        | .....                        | .....                 | ..... | .....                                  | ..... | .....                          | .....                                                         |

Table V.—Yearly Percentages of Principal Zymotic Deaths from 1879 to 1900, inclusive, to Total Mortality.

|                           | 1879. | 1880. | 1881. | 1882. | 1883. | 1884. | 1885. | 1886. | 1887. | 1888. | 1889. | 1890. | 1891. | 1892. | 1893. | 1894. | 1895. | 1896. | 1897. | 1898. | 1899. | 1900. |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Small-pox.....            | ..... | 011   | 066   | 088   | 010   | 010   | 020   | ..... | ..... | 019   | 019   | ..... | ..... | ..... | 034   | 190   | ..... | ..... | ..... | ..... | 046   | ..... |
| Measles.....              | 027   | 574   | 1 107 | 977   | 1 569 | 1 135 | 873   | 888   | 1 181 | 019   | 468   | 186   | 198   | 189   | 230   | 069   | 167   | 324   | 188   | ..... | 348   | 046   |
| Scarlatina.....           | 9 014 | 388   | 388   | 832   | 2 168 | 2 172 | 1 621 | 873   | 1 932 | 324   | 924   | 419   | 605   | 2 331 | 2 118 | 1 896 | 1 006 | 1 040 | 1 219 | 303   | 662   | 1 549 |
| Diphtheria.....           | 5 935 | 6 862 | 6 685 | 5 001 | 4 568 | 3 686 | 3 472 | 3 519 | 3 137 | 4 609 | 5 468 | 3 998 | 2 104 | 3 684 | 4 064 | 7 002 | 5 190 | 4 435 | 3 684 | 1 592 | 2 450 | 4 598 |
| Croup.....                | 2 081 | 1 180 | 2 224 | 1 300 | 1 673 | 1 780 | 1 346 | 1 014 | 933   | 1 767 | 1 160 | 598   | 501   | 596   | 597   | 926   | 582   | 481   | 406   | 135   | 249   | ..... |
| Whooping-cough.....       | 1 513 | 1 101 | 1 029 | 1 029 | 1 818 | 1 887 | 1 870 | 1 804 | 814   | 1 725 | 1 936 | 883   | 868   | 400   | 341   | 922   | 414   | 576   | 349   | 625   | 680   | 848   |
| Typhoid fever.....        | 1 608 | 1 804 | 2 295 | 2 255 | 2 032 | 2 245 | 1 580 | 1 455 | 1 816 | 1 667 | 1 803 | 1 822 | 1 456 | 1 919 | 1 263 | 1 922 | 1 438 | 1 322 | 1 351 | 1 690 | 1 477 | 1 924 |
| Erysipelas.....           | ..... | 791   | 468   | 444   | 431   | 448   | 415   | 430   | 337   | 402   | 823   | 853   | 868   | 839   | 478   | 377   | 300   | 284   | 287   | 376   | 376   | 454   |
| Furunculæ.....            | ..... | 851   | 726   | 832   | 798   | 457   | 907   | 183   | 928   | 176   | 117   | 965   | 170   | 949   | 289   | 138   | 123   | 172   | 117   | 072   | 048   | 248   |
| Carbuncle.....            | ..... | 1 255 | 1 035 | 1 064 | 992   | 903   | 672   | 682   | 685   | 470   | 741   | 894   | 454   | 965   | 823   | 325   | 370   | 878   | 161   | 877   | 377   | 051   |
| Dysentery.....            | 2 481 | 2 565 | 2 606 | 2 558 | 2 731 | 2 396 | 1 767 | 1 805 | 1 578 | 1 510 | 1 580 | 1 119 | 854   | 685   | 709   | 607   | 609   | 546   | 780   | 387   | 618   | 6 837 |
| Diarrhœa.....             | 351   | 406   | 477   | 513   | 524   | 509   | 316   | 302   | 238   | 324   | 314   | 293   | 193   | 904   | 119   | 199   | 139   | 240   | 192   | 138   | 143   | 128   |
| Cholera morbus.....       | ..... | 5 117 | 6 671 | 4 924 | 5 621 | 5 574 | 4 103 | 4 302 | 4 894 | 4 314 | 4 386 | 4 801 | 5 547 | 5 010 | 4 261 | 4 339 | 4 413 | 4 949 | 8 586 | 4 081 | 2 567 | ..... |
| Cholera infantum.....     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Cholera-spinal fever..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Intermittent fever.....   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Remittent fever.....      | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Rheumatism.....           | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Erysipelas.....           | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Syphilis, congenital..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Syphilis, tertiary.....   | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Erysipelas.....           | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Alcoholism.....           | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Septicæmia.....           | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Yellow fever.....         | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Tonsillitis.....          | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

Table VI. — The Number and Percentages of Deaths in each Quarter of each Year during a Period of Thirty-six Years, 1865-1900, inclusive.

| YEARS.    | FIRST QUARTER. |           | SECOND QUARTER. |           | THIRD QUARTER. |           | FOURTH QUARTER. |           | Rate<br>per 1,000<br>Inhabi-<br>tants. <sup>1</sup> |
|-----------|----------------|-----------|-----------------|-----------|----------------|-----------|-----------------|-----------|-----------------------------------------------------|
|           | Deaths.        | Per cent. | Deaths.         | Per cent. | Deaths.        | Per cent. | Deaths.         | Per cent. |                                                     |
|           |                |           |                 |           |                |           |                 |           |                                                     |
| 1865..... | 1,115          | 24.55     | 1,068           | 23.52     | 1,353          | 29.80     | 1,005           | 22.13     | 23.61                                               |
| 1866..... | 999            | 22.81     | 957             | 21.85     | 1,338          | 30.56     | 1,085           | 24.78     | 22.51                                               |
| 1867..... | 1,071          | 24.22     | 950             | 21.49     | 1,191          | 26.94     | 1,209           | 27.35     | 22.38                                               |
| 1868..... | 1,341          | 24.30     | 1,203           | 21.80     | 1,736          | 31.45     | 1,239           | 22.45     | 23.89                                               |
| 1869..... | 1,374          | 24.88     | 1,297           | 23.48     | 1,562          | 28.28     | 1,290           | 23.36     | 23.54                                               |
| 1870..... | 1,395          | 22.88     | 1,314           | 21.55     | 1,983          | 32.52     | 1,406           | 23.05     | 24.34                                               |
| 1871..... | 1,411          | 23.97     | 1,299           | 22.06     | 1,842          | 31.28     | 1,336           | 22.69     | 22.82                                               |
| 1872..... | 1,697          | 20.97     | 1,777           | 21.97     | 2,511          | 31.04     | 2,105           | 26.02     | 30.43                                               |
| 1873..... | 2,115          | 26.88     | 1,726           | 21.93     | 2,278          | 28.95     | 1,760           | 22.24     | 28.75                                               |
| 1874..... | 1,805          | 23.11     | 1,818           | 23.27     | 2,278          | 29.16     | 1,911           | 24.46     | 23.57                                               |
| 1875..... | 2,190          | 24.17     | 2,011           | 22.20     | 2,680          | 29.58     | 2,179           | 24.05     | 26.50                                               |
| 1876..... | 2,246          | 27.21     | 1,809           | 21.92     | 2,375          | 28.78     | 1,823           | 22.09     | 20.96                                               |
| 1877..... | 1,723          | 23.55     | 1,613           | 22.05     | 2,317          | 31.67     | 1,683           | 22.73     | 20.89                                               |
| 1878..... | 1,743          | 22.82     | 1,744           | 22.84     | 2,174          | 28.47     | 1,975           | 25.87     | 21.55                                               |
| 1879..... | 1,947          | 26.32     | 1,615           | 21.83     | 1,959          | 26.48     | 1,877           | 25.37     | 20.63                                               |



|      |       |       |       |        |       |       |       |       |       |
|------|-------|-------|-------|--------|-------|-------|-------|-------|-------|
| 1880 | 2,015 | 23.62 | 1,829 | 21.45  | 2,500 | 29.30 | 2,187 | 25.63 | 23.51 |
| 1881 | 2,352 | 25.86 | 2,021 | 22.42  | 2,466 | 27.35 | 2,197 | 24.38 | 24.48 |
| 1882 | 2,104 | 23.39 | 2,212 | 24.59  | 2,489 | 27.67 | 2,190 | 24.35 | 24.07 |
| 1883 | 2,268 | 23.28 | 2,409 | 24.74  | 2,757 | 28.31 | 2,306 | 23.67 | 25.69 |
| 1884 | 2,284 | 23.73 | 2,103 | 21.85  | 2,725 | 28.33 | 2,510 | 26.09 | 25.01 |
| 1885 | 2,510 | 26.10 | 2,484 | -25.82 | 2,592 | 26.95 | 2,082 | 21.13 | 24.04 |
| 1886 | 2,214 | 23.89 | 2,113 | 22.79  | 2,580 | 27.84 | 2,361 | 25.48 | 23.09 |
| 1887 | 2,362 | 23.45 | 2,281 | 22.65  | 2,912 | 28.90 | 2,518 | 25.00 | 21.41 |
| 1888 | 2,780 | 27.35 | 2,420 | 23.73  | 2,649 | 25.98 | 2,333 | 22.98 | 24.03 |
| 1889 | 2,437 | 23.75 | 2,543 | 24.79  | 2,884 | 27.82 | 2,425 | 23.64 | 23.52 |
| 1890 | 2,911 | 28.60 | 2,244 | 22.04  | 2,690 | 26.51 | 2,327 | 22.85 | 22.70 |
| 1891 | 2,442 | 23.10 | 2,540 | 24.03  | 2,885 | 26.82 | 2,754 | 26.05 | 23.09 |
| 1892 | 2,968 | 26.63 | 2,682 | 22.98  | 2,959 | 26.33 | 2,698 | 24.01 | 24.04 |
| 1893 | 2,969 | 25.35 | 2,847 | 24.31  | 3,013 | 25.74 | 2,881 | 24.60 | 24.55 |
| 1894 | 2,972 | 25.80 | 2,692 | 22.50  | 3,182 | 27.62 | 2,774 | 24.08 | 23.66 |
| 1895 | 2,965 | 26.44 | 2,674 | 22.72  | 3,027 | 26.72 | 2,733 | 24.12 | 22.60 |
| 1896 | 2,897 | 24.90 | 2,807 | 24.13  | 3,319 | 28.53 | 2,611 | 22.44 | 22.53 |
| 1897 | 3,022 | 27.09 | 2,802 | 25.12  | 2,833 | 25.40 | 2,497 | 22.39 | 21.06 |
| 1898 | 2,569 | 23.87 | 2,512 | 23.08  | 3,051 | 28.03 | 2,724 | 25.02 | 20.09 |
| 1899 | 2,987 | 26.75 | 2,632 | 23.57  | 2,800 | 25.07 | 2,748 | 24.61 | 20.12 |
| 1900 | 3,368 | 28.84 | 2,778 | 23.79  | 2,906 | 24.59 | 2,626 | 24.01 | 20.82 |

<sup>1</sup> Population estimated in non-census years on Dr. Farr's formula.

Table VII. — Deaths from Ten of the Principal Causes.

|                                          | Total Deaths from each Cause. | Percentage of each Cause to Total Mortality. | Death per 1,000 Inhabitants. | Total Deaths by Sex. |     | Total Deaths by Sex under Five Years. |       | Total Deaths under Five Years. | Percentage of each Cause under Five Years to Total Mortality. |
|------------------------------------------|-------------------------------|----------------------------------------------|------------------------------|----------------------|-----|---------------------------------------|-------|--------------------------------|---------------------------------------------------------------|
|                                          |                               |                                              |                              | M.                   | F.  | M.                                    | F.    |                                |                                                               |
| Pulmonary tuberculosis.....              | 1,407                         | 12.048                                       | 2.508                        | 764                  | 643 | 35                                    | 30    | 65                             | .557                                                          |
| Pneumonia.....                           | 1,241                         | 10.627                                       | 2.212                        | 621                  | 620 | 238                                   | 217   | 455                            | 3.896                                                         |
| Heart disease.....                       | 1,009                         | 8.640                                        | 1.799                        | 498                  | 511 | 30                                    | 16    | 46                             | .394                                                          |
| Congenital debility, scleremia, etc..... | 786                           | 6.730                                        | 1.401                        | 460                  | 326 | 460                                   | 326   | 786                            | 6.730                                                         |
| Diarrhœa, enteritis, etc.....            | 740                           | 6.337                                        | 1.319                        | 398                  | 347 | 355                                   | 302   | 657                            | 5.626                                                         |
| Violent deaths.....                      | 561                           | 4.804                                        | 1.000                        | 416                  | 145 | 56                                    | 38    | 94                             | .805                                                          |
| Diphtheria and Croup.....                | 537                           | 4.599                                        | .957                         | 266                  | 271 | 186                                   | 173   | 359                            | 3.974                                                         |
| Cerebral hemorrhage and congestion.....  | 489                           | 4.187                                        | .872                         | 229                  | 260 | 8                                     | 10    | 18                             | .154                                                          |
| Cancer.....                              | 452                           | 3.870                                        | .806                         | 168                  | 284 | .....                                 | ..... | .....                          | .....                                                         |
| Simple meningitis...                     | 317                           | 2.714                                        | .565                         | 170                  | 147 | 103                                   | 105   | 208                            | 1.781                                                         |

Table VIII. — Total Deaths each Quarter of the last Five Years, with the Aggregate and Average Number from 1891 to 1895, inclusive.

|                     | 1896.  | 1897.  | 1898.  | 1899.  | 1900.  | 5 years, 1890-1895. |          |
|---------------------|--------|--------|--------|--------|--------|---------------------|----------|
|                     |        |        |        |        |        | Aggregate.          | Average. |
| First quarter.....  | 2,897  | 3,022  | 2,599  | 2,987  | 3,368  | 14,376              | 2,875    |
| Second quarter..... | 2,807  | 2,802  | 2,512  | 2,632  | 2,778  | 13,135              | 2,627    |
| Third quarter.....  | 3,319  | 2,833  | 3,051  | 2,800  | 2,906  | 15,015              | 3,003    |
| Fourth quarter..... | 2,611  | 2,497  | 2,724  | 2,748  | 2,626  | 13,840              | 2,768    |
| Total each year.    | 11,634 | 11,154 | 10,886 | 11,167 | 11,678 | 56,366              | 11,273   |

**Table IX.—Total Deaths and Percentages each Quarter for the year 1900, with Aggregates and Percentages for the Ten Years Previous.**

|                     | 1900.   |           | 1890-1899. |           |
|---------------------|---------|-----------|------------|-----------|
|                     | Deaths. | Per cent. | Deaths.    | Per cent. |
| First quarter.....  | 3,368   | 28.84     | 28,792     | 25.85     |
| Second quarter..... | 2,778   | 23.79     | 26,132     | 23.46     |
| Third quarter.....  | 2,906   | 24.89     | 29,717     | 26.68     |
| Fourth quarter..... | 2,626   | 22.48     | 26,747     | 24.01     |
| Total.....          | 11,678  | 100.00    | 111,388    | 100.00    |

Table X. — Parentage of Children under One, Two, and Five Years for Each Month during Year 1900.

|                       | JANUARY.    |                        |                         | FEBRUARY.   |                        |                         | MARCH.      |                        |                         | APRIL.      |                        |                         | MAY.        |                        |                         | JUNE.       |                        |                         |
|-----------------------|-------------|------------------------|-------------------------|-------------|------------------------|-------------------------|-------------|------------------------|-------------------------|-------------|------------------------|-------------------------|-------------|------------------------|-------------------------|-------------|------------------------|-------------------------|
|                       | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. |
| United States.....    | 34          | 7                      | 20                      | 31          | 15                     | 20                      | 59          | 18                     | 23                      | 48          | 11                     | 18                      | 38          | 15                     | 23                      | 38          | 11                     | 11                      |
| Foreign.....          | 76          | 27                     | 41                      | 82          | 31                     | 38                      | 104         | 35                     | 46                      | 77          | 42                     | 37                      | 88          | 38                     | 33                      | 65          | 26                     | 35                      |
| Mixed.....            | 20          | 7                      | 11                      | 24          | 4                      | 12                      | 36          | 11                     | 7                       | 26          | 6                      | 9                       | 27          | .....                  | 12                      | 15          | 10                     | 4                       |
| One parent known..... | 14          | 1                      | .....                   | 12          | 1                      | .....                   | 18          | 4                      | 1                       | 18          | 4                      | .....                   | 18          | .....                  | 2                       | 12          | 1                      | 1                       |
| Unknown.....          | 8           | 1                      | 1                       | 6           | .....                  | 1                       | 6           | 4                      | 5                       | 4           | 1                      | 1                       | 6           | 1                      | .....                   | 7           | 1                      | .....                   |
| Total.....            | 152         | 48                     | 73                      | 155         | 51                     | 71                      | 223         | 72                     | 82                      | 173         | 64                     | 65                      | 175         | 54                     | 70                      | 135         | 49                     | 51                      |

|                       | JULY.       |                        |                         | AUGUST.     |                        |                         | SEPTEMBER.  |                        |                         | OCTOBER.    |                        |                         | NOVEMBER.   |                        |                         | DECEMBER.   |                        |                         |
|-----------------------|-------------|------------------------|-------------------------|-------------|------------------------|-------------------------|-------------|------------------------|-------------------------|-------------|------------------------|-------------------------|-------------|------------------------|-------------------------|-------------|------------------------|-------------------------|
|                       | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. | Under 1 yr. | 1 yr. and under 2 yrs. | 2 yrs. and under 5 yrs. |
| United States.....    | 77          | 14                     | 10                      | 97          | 17                     | 9                       | 55          | 12                     | 14                      | 63          | 14                     | 10                      | 47          | 8                      | 15                      | 33          | 9                      | 12                      |
| Foreign.....          | 141         | 25                     | 31                      | 144         | 25                     | 29                      | 122         | 27                     | 32                      | 92          | 22                     | 24                      | 60          | 19                     | 42                      | 75          | 25                     | 35                      |
| Mixed.....            | 64          | 7                      | 12                      | 57          | 8                      | 8                       | 44          | 9                      | 9                       | 35          | 5                      | 9                       | 24          | 3                      | 13                      | 23          | 5                      | 8                       |
| One parent known..... | 31          | 5                      | .....                   | 26          | 1                      | .....                   | 19          | 1                      | .....                   | 13          | .....                  | .....                   | 14          | 1                      | 1                       | 8           | 1                      | .....                   |
| Unknown.....          | 7           | 3                      | 4                       | 5           | .....                  | .....                   | 12          | 1                      | .....                   | 4           | 2                      | .....                   | 4           | 1                      | .....                   | 1           | .....                  | .....                   |
| Total.....            | 320         | 54                     | 57                      | 329         | 51                     | 46                      | 252         | 50                     | 55                      | 207         | 43                     | 43                      | 149         | 32                     | 71                      | 140         | 40                     | 55                      |

Table XI.—Cases Reported, and Deaths from Small-pox, Diphtheria, Scarlet Fever, and Typhoid Fever, with Percentages.

| DATE. | SMALL-POX. |         | Percentages. | DIPHTHERIA. |         | Percentages. | SCARLET FEVER. |         | Percentages. | TYPHOID FEVER. |         | Percentages. |
|-------|------------|---------|--------------|-------------|---------|--------------|----------------|---------|--------------|----------------|---------|--------------|
|       | Cases.     | Deaths. |              | Cases.      | Deaths. |              | Cases.         | Deaths. |              | Cases.         | Deaths. |              |
| 1872  | 2,592      | 738     | 98.4         | 1,370       | 448     | 32.7         | 1,824          | 104     | 7.7          |                |         |              |
| 1873  | 1,103      | 302     | 97.3         | 1,167       | 391     | 33.5         | 951            | 68      | 8.0          |                |         |              |
| 1874  | 7          | 1       | 34.5         |             |         |              |                | 149     | 16.6         |                |         |              |
| 1875  | 5          | 2       | 30.0         |             |         |              |                |         |              |                |         |              |
| 1876  | 6          | 2       | 33.33        |             |         |              |                |         |              |                |         |              |
| 1877  | 17         | 4       | 23.5         |             |         |              |                |         |              |                |         |              |
| 1878  |            |         |              |             |         |              |                |         |              |                |         |              |
| 1879  |            |         |              |             |         |              |                |         |              |                |         |              |
| 1880  | 4          | 1       | 25.0         | 1,715       | 588     | 34.2         | 497            | 33      | 6.6          |                |         |              |
| 1881  | 44         | 6       | 13.6         | 1,680       | 601     | 35.7         | 383            | 35      | 9.1          |                |         |              |
| 1882  | 94         | 8       | 8.33         | 1,386       | 456     | 33.04        | 689            | 75      | 10.9         |                |         |              |
| 1883  | 8          | 1       | 12.4         | 1,375       | 444     | 31.4         | 1,438          | 911     | 14.7         |                |         |              |
| 1884  | 1          | 1       | 100.0        | 1,219       | 345     | 28.46        | 2,226          | 269     | 8.2          |                |         |              |
| 1885  | 11         | 1       | 9.0          | 1,283       | 334     | 26.44        | 1,605          | 196     | 7.2          |                |         |              |
| 1886  | 1          |         |              | 1,788       | 329     | 18.4         | 1,449          | 81      | 5.6          |                |         |              |
| 1887  | 4          |         |              | 1,749       | 316     | 18.1         | 1,349          | 135     | 9.9          |                |         |              |
| 1888  | 8          | 1       | 12.4         | 1,311       | 370     | 28.2         | 707            | 95      | 13.4         |                |         |              |
| 1889  | 10         | 2       | 20.0         | 1,314       | 504     | 38.4         | 380            | 36      | 9.5          |                |         |              |
| 1890  | 1          |         |              | 1,275       | 401     | 31.5         | 31,08          | 93      | 4.96         |                |         |              |
| 1891  |            |         |              | 1,851       | 292     | 15.8         | 924            | 42      | 4.54         |                |         |              |
| 1892  |            |         |              | 1,383       | 414     | 30.0         | 1,327          | 64      | 4.82         |                |         |              |
| 1893  | 25         | 4       | 15.3         | 3,465       | 576     | 16.6         | 2,858          | 292     | 8.51         |                |         |              |
| 1894  | 77         | 22      | 28.5         | 3,019       | 817     | 27.06        | 2,230          | 248     | 11.1         |                |         |              |
| 1895  |            |         |              | 4,080       | 588     | 14.48        | 2,230          | 192     | 8.60         |                |         |              |
| 1896  |            |         |              | 3,489       | 616     | 17.9         | 1,612          | 114     | 7.07         |                |         |              |
| 1897  | 10         |         |              | 3,388       | 411     | 12.09        | 1,368          | 136     | 9.95         |                |         |              |
| 1898  |            |         |              | 2,661       | 270     | 10.23        | 1,368          | 53      | 3.76         |                |         |              |
| 1899  | * 29       | 5       | 17.24        | 2,886       | 277     | 9.6          | 1,381          | 74      | 5.36         |                |         |              |
| 1900  | 7          |         |              | 4,977       | 537     | 10.79        | 1,710          | 181     | 10.58        |                |         |              |

\* Including one case and one death at quarantine.

## REGULATIONS.

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During the past year the Board has found it necessary, from time to time, to adopt the following regulations :

### BARBER SHOPS.

May 4, 1900.

At a meeting of the Board of Health, this day, the following regulation respecting barber shops was adopted :

The place of business, together with all the furniture, shall be kept, at all times, in a cleanly condition.

Mugs, shaving brushes and razors shall be sterilized by immersion in boiling water after every separate use thereof.

A separate, clean towel shall be used for each person.

Alum, or other material, used to stop the flow of blood shall be so used only in powdered form, and applied on a towel.

The use of powder-puffs is prohibited.

The use of sponges is prohibited.

Every barber shop shall be provided with running hot and cold water.

No person shall be allowed to use any barber shop as a dormitory.

Every barber shall cleanse his hands thoroughly immediately after serving each customer.

### ICE DEALERS.

May 9, 1900.

At a meeting of the Board of Health this day, the following regulation was adopted, to take effect from this date :

*Ordered*, That each and every party selling ice in Boston, fill out over the signature of the chief clerk or other responsible officer of the party and return to the Board of Health at its office, Old Court House, Boston, Mass., on or before June 1 of the year, a blank of the following form :

1. Give the name and situation of each and every river, brook, pond or lake from which you cut ice, and the approximate number of tons you cut annually from each.

2. Give the name of each and every party from whom you take ice to sell and the approximate number of tons taken annually from each.















3. Give the situation of each and every storehouse, depot, agency, railroad terminal or other place from which you take your ice into vehicles for distribution in Boston.

4. Give the name of each and every party distributing ice in Boston, to whom you regularly or occasionally supply ice, and the approximate number of tons supplied to each.

5. Do you classify the ice you sell as "For drinking purposes," "For cooling purposes only, not to be used for drinking?" etc.

6. Do you sell "snow ice?"

7. Do you flood your ice field?

8. Do you have chemical analyses made for you of the water used or of the ice therefrom?

9. Do you take precautions to maintain your sources of supply in good, clean and wholesome condition, and if so, what?

#### POULTRY.

July 24, 1900.

At a meeting of the Board of Health this day, the law relating to the killing of poultry, passed July 16, 1896, was amended so as to read as follows:

No live chickens, geese, ducks or other fowls, shall be brought into or kept, or held, or offered for sale, or killed or plucked, in any place in the City of Boston, without a permit therefor in writing from the Board of Health, which shall be subject to revocation by said Board at any time.

No carcass of any hen, chicken, turkey or goose shall be brought into, or exposed for sale in the City of Boston, unless the feathers have been removed from said carcass before the same is brought within the City limits.

#### REFUSE.

July 31, 1900.

At a meeting of the Board of Health, this day, it was voted to amend the regulation prohibiting the removal of refuse, etc., passed by this Board September 8, 1876, so that it will read as follows:

*Ordered,* That no person removing earth, dirt, sawdust, soot, ashes, shavings, hair, shreds, manure, oysters, clams or lobsters, waste water, or any animal or vegetable substance, house offal, swill, rubbish or filth of any kind whatsoever, shall suffer it to leak, escape or drop from any vehicle by him owned or driven into or upon any street, court, square, lane, alley, wharf or public enclosure in the city of Boston, or suffer offensive odors to escape from such vehicles to the discomfort or annoyance of people residing, doing business or travelling on the route over which such vehicles are driven. Nor shall any person engaged

in collecting any of the articles heretofore enumerated suffer any vehicle to remain standing in any street, court, square, lane, alley, wharf or public enclosure in the City of Boston, except for the purpose of removing the refuse so collected, for a longer time than ten consecutive minutes.

#### MILK.

August 31, 1900.

At a meeting of the Board of Health, this day, the following regulation was adopted :

“ No milk drawn from a cow in the City of Boston within forty-eight hours after said cow is brought into said city shall be sold or used for human food, and all milk drawn from any cow within forty-eight hours after said cow is brought into said City shall be destroyed within one hour after it is drawn from the cow.”

#### CONTAGIOUS DISEASES.

December 24, 1900.

At a meeting of the Board of Health, this day, the regulation respecting contagious diseases, adopted July 1, 1895, was amended so as to read as follows :

Whoever is infected with small-pox, scarlet fever, diphtheria, or croup, shall immediately proceed to some isolated place or room designated by the Board of Health, and no person who has been so affected shall leave such place or room, and no article shall be removed from such place or room, until the Board of Health shall certify, in writing, that all danger of communicating such disease to others is passed.

Every parent or guardian of any child or ward infected with small-pox, scarlet fever, diphtheria, or croup, shall immediately cause such child or ward to be conveyed to some isolated place or room approved by the Board of Health, and no parent or guardian shall permit such child or ward to remove from such place or room until the Board of Health shall find and certify, in writing, that all danger of communicating such disease to others has passed.

No person other than the attending physician, nurse, and agents of the Board of Health shall enter any apartment or other place set apart for the treatment of small-pox, scarlet fever, diphtheria, or croup, until the Board of Health shall certify, in writing, that such apartment or place has been satisfactorily disinfected.

No person having the care of any other person who has been affected with small-pox, scarlet fever, diphtheria, or croup, shall advise or permit such other person to leave any place designated by the Board of Health as a place of isolation of such infected person before said Board of Health shall have certified, in writ-

ing, that such person can leave such designated place without danger to others.

No physician who has been in attendance upon any person who has been infected with small-pox, scarlet fever, diphtheria or croup, shall advise or knowingly permit such person to leave any place designated by the Board of Health as a place of isolation of such infected person before said Board of Health shall have certified, in writing, that such infected person can leave such place without danger to others.

In cases of small-pox, all crusts resulting from the pustules must have disappeared, and the patient, and all infected articles, be disinfected before being released from isolation.

In cases of scarlet fever, all traces, of desquamation must have disappeared, and the patient, and all infected articles, be disinfected before being released from isolation.

In cases of diphtheria, all traces of the false membrane must have disappeared, two consecutive negative cultures from both nose and throat be obtained (the second one to be obtained by an agent of the Board of Health), and the patient, and all infected articles, be disinfected before being released from isolation.

#### HORSESHOEING SHOPS.

February 28, 1901.

*Whereas*, the Board of Health is of the opinion that walls, hitching-bars, chains, and ropes in horseshoeing shops to which animals affected by a disease known as glanders have been secured are liable to become the means of spreading said disease to healthy animals subsequently secured to such walls, hitching-bars, chains, and ropes, it is therefore

*Ordered*, That the walls, hitching-bars, chains, ropes or other apparatus in horseshoeing shops to or by which horses may at any time be secured, shall be thoroughly disinfected by the proprietor of such shops with a 5% solution of chloride of lime at the close of each day's business.

#### REFUSE MATERIAL.

January 21, 1901.

At a meeting of the Board of Health this day, it was voted to amend its regulation, passed February 28, 1899, prohibiting the storage of rags, old paper, and other refuse material in any building used as a dwelling, so as to read as follows:

*Whereas*, It is a practice in this City to collect rags, old paper, junk, and other refuse material, from dumping-grounds, streets, and other places and to store, sort, and otherwise handle the same within dwellings, and

*Whereas*, In the opinion of this Board, such rags, old paper, junk, and other refuse material are a source of filth, and capable of conveying infectious diseases from person to person, and of otherwise creating sickness, therefore

*Ordered*, That on and after this date, no rags, old paper, junk, or other refuse material, gathered or recovered from any source, shall be brought into or allowed to remain within any building used as a dwelling.

#### DISINFECTION.

The following tables show the work of disinfection during the year at the expense of the Department:

|                                    |   |   |   |   |        |
|------------------------------------|---|---|---|---|--------|
| Diphtheria, number of houses after | . | . | . | . | 4,977  |
| Scarlet fever, "                   | " | " | " | " | 1,710  |
| Phthisis, "                        | " | " | " | " | 685    |
| Measles, "                         | " | " | " | " | 71     |
| Small-pox, "                       | " | " | " | " | 7      |
| Chicken pox, "                     | " | " | " | " | 11     |
| Cancer, "                          | " | " | " | " | 14     |
| Typhoid fever, "                   | " | " | " | " | 7      |
| Glanders, "                        | " | " | " | " | 205    |
| Bedding, etc., lots                | . | . | . | . | 112    |
| Books, "                           | . | . | . | . | 358    |
| Clothing etc., "                   | . | . | . | . | 135    |
| Carriages                          | . | . | . | . | 31     |
| School-houses                      | . | . | . | . | 105    |
| Rooms disinfected                  | . | . | . | . | 13,798 |

#### *Materials Used.*

|                                |   |   |   |   |              |
|--------------------------------|---|---|---|---|--------------|
| Formaldehyde, 40% solution     | . | . | . | . | 2,897 galls. |
| Alcohol for heat               | . | . | . | . | 1,481 "      |
| Chloride of lime               | . | . | . | . | 55,624 lbs.  |
| Bi-chloride of mercury         | . | . | . | . | 1,175 "      |
| Chloride of sodium (in mixing) | . | . | . | . | 1,200 "      |



|                   | January. | February. | March. | April. | May.  | June.  | July.  | August. | September. | October. | November. | December. | Total. |
|-------------------|----------|-----------|--------|--------|-------|--------|--------|---------|------------|----------|-----------|-----------|--------|
| Streets .....     |          |           | 11     | 21     | 47    | 63     | 84     | 93      | 43         | 9        | 7         | 1         | 379    |
| Places .....      |          |           | 22     | 44     | 78    | 169    | 356    | 371     | 161        | 19       | 13        | 4         | 1,237  |
| Courts .....      |          |           | 17     | 37     | 63    | 214    | 362    | 381     | 114        | 21       | 7         | 5         | 1,221  |
| Alleys .....      |          |           | 31     | 197    | 301   | 419    | 917    | 893     | 522        | 115      | 19        | 12        | 3,426  |
| Passageways....   |          | 9         | 62     | 601    | 592   | 973    | 1,143  | 1,361   | 834        | 179      | 51        | 23        | 5,828  |
| Yards .....       |          | 21        | 363    | 705    | 978   | 1,893  | 3,584  | 3,925   | 1,474      | 226      | 78        | 45        | 13,292 |
| Vaults .....      | 7        | 11        | 14     | 21     | 37    | 91     | 127    | 141     | 93         | 26       | 13        | 7         | 588    |
| Cellars .....     | 41       | 63        | 198    | 536    | 1,095 | 1,953  | 3,536  | 3,881   | 1,674      | 326      | 112       | 39        | 13,404 |
| Gutters .....     |          |           | 14     | 187    | 430   | 687    | 1,168  | 1,562   | 875        | 161      | 82        | 6         | 5,172  |
| Water-closets ..  | 191      | 143       | 487    | 519    | 715   | 1,283  | 1,578  | 1,619   | 841        | 216      | 232       | 256       | 8,080  |
| Urinals .....     | 14       | 17        | 24     | 41     | 57    | 59     | 161    | 171     | 105        | 26       | 19        | 12        | 703    |
| Vacant lots ..... |          |           | 2      | 31     | 74    | 91     | 286    | 272     | 131        | 17       | 10        | 1         | 915    |
| Filthy rooms...   | 216      | 301       | 295    | 382    | 478   | 512    | 351    | 386     | 362        | 386      | 397       | 312       | 4,378  |
| Filthy sheds....  | 11       | 18        | 76     | 469    | 657   | 863    | 1,485  | 1,542   | 871        | 136      | 113       | 13        | 6,254  |
| Sinks .....       | 131      | 179       | 267    | 693    | 1,019 | 1,284  | 2,174  | 2,574   | 1,485      | 393      | 361       | 316       | 10,876 |
| Cesspools .....   |          |           | 51     | 695    | 871   | 1,592  | 2,353  | 3,565   | 1,649      | 124      | 113       | 15        | 11,028 |
| Total .....       | 611      | 762       | 1,934  | 5,179  | 7,492 | 12,146 | 19,665 | 20,717  | 11,234     | 2,380    | 1,627     | 1,067     | 86,781 |

The following table shows the number of nuisances abated by the owners or occupants of premises by order of the Board of Health :

|                                                     | January. | February. | March. | April. | May.  | June. | July. | August. | September. | October. | November. | December. | Total. |
|-----------------------------------------------------|----------|-----------|--------|--------|-------|-------|-------|---------|------------|----------|-----------|-----------|--------|
| House drains repaired...                            | 343      | 200       | 209    | 280    | 204   | 201   | 148   | 248     | 262        | 318      | 281       | 207       | 2,901  |
| Vaults cleaned and repaired .....                   | 4        | 3         | 10     | 10     | 23    | 14    | 15    | 42      | 15         | 13       | 14        | 7         | 170    |
| Traps supplied .....                                | 87       | 45        | 58     | 62     | 66    | 82    | 48    | 62      | 99         | 118      | 107       | 82        | 916    |
| Yards cleaned .....                                 | 90       | 54        | 130    | 586    | 154   | 135   | 141   | 318     | 138        | 114      | 113       | 96        | 2,014  |
| Cellars cleaned.....                                | 150      | 109       | 112    | 239    | 134   | 130   | 130   | 227     | 194        | 169      | 117       | 97        | 1,808  |
| Cesspools cleaned.....                              | 8        | 8         | 26     | 53     | 53    | 43    | 38    | 76      | 41         | 27       | 20        | 13        | 406    |
| Water-closets cleaned and repaired.....             | 342      | 220       | 271    | 327    | 296   | 234   | 164   | 195     | 276        | 309      | 240       | 220       | 3,094  |
| Number of places from which fowls were removed..... | 3        | 2         | 5      | 15     | 17    | 11    | 17    | 15      | 17         | 8        | 6         | 7         | 123    |
| Supply pipes repaired..                             | 46       | 36        | 26     | 31     | 35    | 22    | 23    | 27      | 27         | 22       | 16        | 16        | 327    |
| Privies cleaned and repaired .....                  |          |           |        | 1      | 1     |       | 5     | 3       |            | 1        |           |           | 11     |
| General cleaning and repairing.....                 | 83       | 42        | 64     | 72     | 72    | 57    | 47    | 53      | 37         | 53       | 38        | 40        | 653    |
| Exposed manure removed.....                         | 7        | 4         | 1      | 3      | 8     | 2     | 5     | 5       | 4          | 4        | 2         | 1         | 46     |
| Passageways cleaned...                              | 15       | 12        | 23     | 132    | 63    | 50    | 64    | 135     | 66         | 45       | 28        | 40        | 673    |
| Sheds cleaned.....                                  | 29       | 4         | 5      | 163    | 70    | 17    | 13    | 31      | 22         | 23       | 23        | 4         | 404    |
| Tenements white-washed.....                         | 36       | 18        | 117    | 259    | 276   | 123   | 66    | 45      | 47         | 31       | 31        | 13        | 1,062  |
| Stables cleaned.....                                | 6        |           | 1      | 4      | 8     | 6     | 12    | 8       | 8          | 11       | 4         | 1         | 69     |
| Sundry nuisances abated.....                        | 24       | 30        | 26     | 39     | 35    | 43    | 84    | 53      | 45         | 17       | 23        | 23        | 442    |
| Rain conductors re-repaired.....                    | 3        | 1         | 6      | 9      | 8     | 8     | 4     | 9       | 6          | 8        | 9         | 7         | 78     |
| Roofs repaired.....                                 | 9        | 6         | 8      | 14     | 7     | 8     | 4     | 13      | 7          | 6        | 4         | 3         | 89     |
| Receptacles provided for garbage.....               | 11       | 1         | 2      | 16     | 9     | 15    | 42    | 36      | 20         | 7        | 9         | 6         | 174    |
| Places from which swine were removed..              |          |           |        | 2      | 2     |       |       |         | 1          |          |           |           | 5      |
| Stagnant water removed from vacant lots .....       |          |           | 8      | 10     | 16    | 9     | 13    | 7       | 7          | 4        | 4         | 4         | 82     |
| Vacant lots cleaned ....                            | 2        | 9         | 12     | 44     | 32    | 24    | 18    | 19      | 17         | 11       | 8         | 2         | 198    |
| Houses cleared of dead rats .....                   | 1        | 2         | 2      | 2      | 1     | 2     | 1     |         | 1          | 1        |           |           | 13     |
| Overcrowded rooms relieved .....                    | 13       | 8         | 9      | 2      | 2     | 6     | 3     | 6       |            |          | 1         | 5         | 55     |
| Gas-pipes repairs.....                              | 6        | 1         | 3      | 2      | 2     | 4     |       | 2       | 1          | 1        | 1         |           | 23     |
| Dark rooms corrected..                              | 190      | 63        | 95     | 107    | 78    | 51    | 17    | 21      | 34         | 56       | 35        | 42        | 789    |
| Dark and unventilated water-closets remedied        | 256      | 148       | 109    | 210    | 87    | 66    | 34    | 85      | 126        | 44       | 48        | 39        | 1,252  |
| Total.....                                          | 1,764    | 1,026     | 1,338  | 2,644  | 1,759 | 1,363 | 1,156 | 1,796   | 1,518      | 1,421    | 1,182     | 975       | 17,882 |

## ALLEYWAYS.

In the year 1894 an act was passed by the Legislature giving the Board of Health the power to order private ways paved, when, in their judgment, the public health demanded it, but made no provision as to the manner in which the work should be done, except to provide for a hearing, if requested, and an appeal to the Court of Equity in case any of the abutters refused to comply. While a great many private ways were paved under this act, it always proved to be very unsatisfactory for many reasons. First, on account of the difficulty of determining the rightful owners; second, in getting the different abutters to sign an agreement to pay their proportionate share for the work (as in many cases it would require almost a hundred signatures) in determining as to whether the bidders were responsible to do the work in a proper manner, and if, after the work was done, it was as it should be. This last problem was important as it was work entirely foreign to the work of the Department, and should, in justice to the parties paying for it, be passed upon only by engineers competent to give the proper grades and judge if the pavement were properly laid. In consequence of these many difficulties, the Chairman of the Board had a consultation with Mayor Quincy, the result of which was, that in 1898 an act was passed which gave to the Street Commissioners the power to lay out certain alleys as "Public Alleys," the work to be done by the Street Department, and the expense to be a lien on the property. While at the time of its enactment it was supposed this act would do away with all difficulties of the former one, it has not done so, as a large proportion of the alleys do not, according to the decision of the Corporation Counsel, come under its provisions, and it certainly should be amended as soon as possible to cover the ground for which it was originally intended.

These private passageways constitute one of the great sources of nuisance, of great annoyance and trouble to the owner and abutter and to the Board of Health. In a great many cases there are from seventy to eighty abutters; a report must be made, the owners and their addresses looked up in or out of the City, notices written and sent to them, and this on an average of once a week from May to October. In addition to this is the fact that the nuisance in these alleys is almost invariably caused by the outside public, and the abutters, in no way responsible, are obliged to clean up the nuisance caused by these outsiders, not once but many times during the season. Another serious cause of delay is the fact that in a great

many instances the owner lives out of the City and pays no attention to the notices of the Board of Health.

The Board of Health would therefore recommend that the City Council consider the propriety of having this work done by the Street Department at the time they clean the adjacent streets, which might easily be done, as they have the facilities at hand to do the work, as ordered by the Mayor, on public alleys.\*

#### TIDE-WATER FLATS.

The flats lying between Dorchester avenue, Swett street, the N. Y., N. H. & H. R.R., and land of Pierce & Cavanagh in South Boston were the source of extremely offensive odors during the summer of 1900, and were bitterly complained of by the residents of Washington Village and its vicinity. An examination showed several acres of flats left bare at low tide and covered with a most foul smelling semi-liquid filth, largely due to unclean materials used in the process of filling. The odors were very offensive, travelled considerable distances, and the complaints were fully justified. The owners of the offensive flats were notified, met the Board of Health on the premises to discuss the methods of relief and were ordered to abate the nuisance. Several hearings and conferences were held in the office of the Board of Health, at which efforts were made to bring about an agreement between the several owners to unite in building an inexpensive dam (recommended by the Board of Health) and which would have quickly abated the nuisance and held it while the filling was being done for permanent effect. The Board, finding it impossible to secure action on the part of the owners by this process, and having no money in its appropriation which could be used for this purpose, requested the Law Department, on July 28, to proceed against the owners for maintaining a nuisance. The case is still pending and the nuisance still exists, and will be heard from without doubt next season. For less than one thousand dollars the Board of Health would have abated the nuisance in two weeks, saved incalculable discomfort to residents and travellers near this place for the whole summer, and the expense would have become a lien upon the property to remunerate the City.

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\* MAYOR'S OFFICE,

BOSTON, MASS., 10 September, 1900.

*To the Board of Health :*

GENTLEMEN,—The complaints in regard to Chair Alley and Public Alleys Nos. 102 and 440 are returned herewith. Public alleys will be cleaned in the future by the Street Department, the same as public streets.

Respectfully,

(Signed),

THOMAS N. HART, Mayor.

## ROXBURY CANAL.

The old Roxbury canal, near the junction of Albany street and Massachusetts avenue, is still a subject of complaint. It is one of the most foul-smelling spots in the City, and is within 300 feet of the City Hospital, in which there are 830 patients, and abuts one of the principal thoroughfares of the City. It has no means for flushing away its constantly accumulating filth, and the Board of Health has no power to abate the nuisance. The overflow from the City sewer into this canal is regarded as a necessity, and must therefore continue. Any immediate or temporary relief must come from the removal of accumulated filth by dredging the head of the canal for a distance of at least two hundred feet. The following correspondence pertains to this nuisance, which remains unabated, and which should receive attention before the warm season returns. Considering the difficulties in the way of relieving the stagnant and unwholesome condition of the waters in the dead end of the canal leading from the Fenway basins to Huntington avenue in connection with the difficulties found in the Roxbury canal, we would respectfully suggest that the City Engineer be asked to consider the feasibility of connecting these two canals by a proper conduit, and take advantage of the waters at a higher level in the Fenway basins to flush the filthy contents of the two canals down Fort Point channel to the harbor on the latter part of each ebb tide. If this should be considered feasible and not too expensive, it would undoubtedly relieve the whole trouble in the Fenway basins by a daily renewal with clean water from Charles river, and greatly mitigate the condition of the Roxbury canal.

HEALTH DEPARTMENT, OLD COURT HOUSE,  
BOSTON, October 4, 1900.

HON. THOMAS N. HART,

*Mayor of the City of Boston :*

DEAR SIR, — We beg to call your attention to the bad condition of the old Roxbury canal, which extends from Swett street to the South Bay. It receives a storm overflow from the Albany street sewer, and also a considerable quantity of dry weather sewage. It is a long pocket in which foul matters lodge without having the means of flushing. At low tide particularly the offence is so great as to be an extreme nuisance and a menace to the health and comfort of the whole neighborhood, but particularly to the inmates of the City Hospital. The bed of this canal is covered with soft filth to the depth of several feet. We

know of no way in which this nuisance can be rendered tolerable except by occasional dredging, which ought to be done now without delay.

Yours very truly,

(Signed)

SAMUEL H. DURGIN,

*Chairman.*

#### GARBAGE PLANT.

The warm season of 1900 brought the same complaints against the odors from the garbage plant at Cow Pasture by the residents of Dorchester and South Boston, as occurred in 1899, the first year of the operation of the plant at this place. The same exhaustive investigation was made by the Board of Health as was done in 1899. Hearings were also given, and the evidence of more than one hundred of the most trustworthy citizens of Dorchester and South Boston was taken. This evidence was wholly in support of the complaints against the garbage plant and in corroboration of the evidence otherwise gained by the personal observations of the Board and its officers. The Board declared by unanimous vote that in its judgment said garbage plant was a public nuisance, and of such character as to warrant an appeal to the Supreme Court for an injunction to restrain the New England Sanitary Product Company from further operation of the plant. The City Solicitor was called and requested to make said application to the Supreme Court in behalf of the Board of Health, which he did on July 27, 1900, and on September 4, the defendant company, by its counsel, filed a demurrer, which the Court decided to hear on October 16. The counsel for the defence secured delay on said hearing, and the delay was not only secured but has been maintained ever since against the expressed wishes and to the great annoyance of the Board of Health, which has been ready and amply prepared with evidence to meet the case in court at any time. The Board desires to disclaim any part of the responsibility for the delay in bringing this case to trial or for any lack of effort to relieve the discomfort of the complainants.

The following communications refer to this subject:

HEALTH DEPARTMENT, OLD COURT HOUSE,  
BOSTON, July 13, 1900.

HON. THOMAS N. HART,

*Mayor of the City of Boston:*

DEAR SIR, — The order of the Common Council "That the Board of Health, through his Honor the Mayor, make a report as to whether the Garbage Plant at Cow Pasture is a nuisance to the

residents of Dorchester and South Boston, and if it is, why is it not abated," and referred to the Board of Health by his Honor, the Mayor, with request for its return with report, has this day been received. In compliance with this request we have to say that we completed our second investigation of the Garbage Plant on the 23d day of June and was convinced that "the Garbage Plant at Cow Pasture" was a nuisance to the residents of Dorchester and South Boston. The Board then reviewed the language of the garbage contract and concluded to ask the Corporation Counsel certain questions concerning said contract, which contract the Board had previously, but without due care, thought to be available in case the plant should become a nuisance. Three days later, on June 26, the Board addressed the Corporation Counsel and received his reply, as will be seen by the following communications:

"OFFICE OF THE BOARD OF HEALTH, June 26, 1900.

Mr. ANDREW J. BAILEY,

*Corporation Counsel:*

DEAR SIR, — Referring to the contract between the City of Boston and 'The New England Sanitary Product Company,' if the Board of Health should be satisfied, and should so declare to the Superintendent of Streets, that the Garbage Plant at Cow Pasture, being conducted under said contract, is a nuisance and 'objectionable to the public health and comfort,' would this declaration, signed by the Superintendent of Streets and approved by the Board of Health and the Mayor, and served upon said company, place the Superintendent of Streets in a position to cancel said contract?

Or, can said company conduct said Plant for five days in succession in such a manner as to create a public nuisance, 'objectionable to the public health and comfort,' and repeat this experience indefinitely, with intervals of a day of relief between the five-day periods, without violating the terms of said contract and rendering same liable to revocation by the City?

Very truly yours,

(Signed)

SAMUEL H. DURGIN, *Chairman.*"

"OFFICE OF THE BOARD OF HEALTH, July 5, 1900.

Mr. ANDREW J. BAILEY,

*Corporation Counsel:*

DEAR SIR, — I trust you will pardon what might seem impatience on the part of the Board of Health in asking for a reply to our questions concerning the Garbage Plant contract, submitted on the 26th ult., as early as possible. The Board is unable to take further steps in one line of its duty until it hears from you, and is, therefore, in an uncomfortable attitude.

Yours very truly,

(Signed)

SAMUEL H. DURGIN, *Chairman.*"

"LAW DEPARTMENT, July 12, 1900.

*To the Board of Health:*

In reply to your communication inquiring as to the power of the Board of Health over the method of carrying on the work of the New England Sanitary Product Company at Cow Pasture, I have to say that under the provisions of Article 9 of that contract 'if the contractor from any cause except fire, or extraordinary ice in the water surrounding the City or of Boston Harbor, or of process of law, or other extraordinary or unavoidable cause as aforesaid, shall fail for more than five successive days to remove or to cremate or render said garbage as required in this contract, or dispose of the residue or waste thereof as so required, the superintendent (of streets), acting for the City, by notice in writing to that effect, signed by him and approved by the Board of Health of said City and the Mayor, given to the contractor or mailed to him at the business address given by him to the superintendent, may cancel said contract, or, etc.'

You will see by this that the power of the Board of Health, so far as the contract is concerned, is simply to approve the action of the superintendent, and if the superintendent draws up a notice of the description set forth in that Article and that notice is approved by the Board of Health and the Mayor, his power is absolute to cancel the contract, and that is the end of the company's authority to do any work thereunder.

Respectfully,

(Signed)

ANDREW J. BAILEY,

*Corporation Counsel."*

On receiving the Corporation Counsel's reply yesterday, the Board concluded that the garbage contract was not available in case the plant became a nuisance. The Board now has but one recourse, and it is already taking such other steps as may be necessary in the proper treatment of this subject.

Very truly yours,

SAMUEL H. DURGIN,

*Chairman.*

TENEMENT HOUSES.

The semi-annual inspections of tenement houses have been made as usual. Under the law, a tenement house in Massachusetts is one occupied by four or more families, while in New York it is one occupied by three families, which was the law in Massachusetts until the statute was amended in 1894. This change was, in the opinion of the Board of Health, a step in the wrong direction, as a great majority of the three-family houses require supervision fully as much as



do four-family houses, and are equally in need of semi-annual inspection and of the benefits of the law compelling whitewashing. While the statute compels a semi-annual inspection, a very large number of the tenement houses in the poorer sections of the City require a weekly, and, in many cases, almost a daily visit, in order that they may be kept in anything like a cleanly condition, as the tenants of this class of houses, instead of carrying their garbage and rubbish down stairs and placing the same in the proper receptacle, just throw it out of the windows, either into the yard of their own house, or, as is more often the case, into the yard of the adjoining house, the owner of which may be a person who is making an honest endeavor to keep his premises in a cleanly condition, and the discouraging part of the whole matter is that the Board of Health is obliged to compel the innocent owner of the property to clean up. The great bulk of the tenement houses of Boston are composed of buildings originally erected for one or two families, which have been converted by means of partitions into four and six-family tenements. Houses originally having two rooms on a floor have thus been altered into four-room tenements on each floor, the two inside rooms being without either light or ventilation.

During the year 749 of these dark rooms have been so changed as to provide light and ventilation. On re-inspection of these tenement houses, where light and ventilation have been provided by means of transoms and openings cut in partitions, it is almost invariably found that the openings have been closed or covered up by the tenant.

Another very bad feature in connection with these altered-over houses is the location of the water-closets, as in the old days they were located either in the darkest corner of the cellar, or in the entry under the stairs, with no ventilation and not a ray of light. During the year 1,252 such water-closets have been changed so as to provide light and ventilation, and in all cases where there was any possibility, they have been located where they can have outside light and air. In addition to this relocation of water-closets, 3,074 have been cleaned, repaired, and put in good condition. While a great deal of work has been done in this direction the past year, there is still much more to be done.

During the winter season there is still much overcrowding in tenement houses. This can be determined only by night inspection, which has been made from time to time, and as a result, the tenements in these districts now are being measured and cards posted in the language of the different

nationalities, denoting the number of persons allowed to sleep in each room.

In Boston, as in all other large cities, open areas or breathing spaces should be provided in the congested tenement-house districts, and as this is being done in large cities all over the world, Boston should not be behind. The Board of Health in this connection recommend that, as Cross street is to be widened in the near future, the territory bounded by Salem street, the northerly side of Stillman street, the easterly side of Endicott street, and the northerly side of Cross street be taken possession of by the City and made a breathing spot, thus doing away with a number of old, unsanitary and dilapidated tenement houses, and also abolishing Morton street, which is one of the narrowest, dirtiest, and most unsanitary streets in the City of Boston.

#### HOSPITAL FOR CONSUMPTIVES.

A year ago the Board of Health called for reports of all cases of consumption affecting the lungs and throat, with a view of isolating as many of the cases as might seem best, giving instructions to all, and disinfecting after every removal of such a case. The work has progressed favorably with the aid and approval of the medical profession and the community. The one thing lacking in making this work more effective is a well located and accessible hospital for patients in the advanced stages of the disease, and where the necessary treatment and security against the spread of the disease cannot otherwise be obtained. Thus far we have made moderate use of the Tewkesbury Almshouse, Long Island Almshouse, and some private hospitals within the City. There are evident objections and some difficulty in securing sufficient hospital accommodations for our patients in this way, and we respectfully beg that provision for this class of patients be made as soon as it may be found practicable. The following circular was issued for the information of persons suffering from this disease:

#### CONSUMPTION.

May 1, 1900.

Directions for consumptives and those living with them :

Consumption is caused by the bacillus of tuberculosis, a particular form of germ. This germ grows in the lungs of the consumptive patient in enormous numbers, and the material (called sputum or spit) coughed up by the patient contains a great many of them. When this sputum is allowed to dry in the room, it may become

powdered and be blown about in the air. Any person breathing this air in the room may take the germs into their lungs, and, after a time, become consumptive.

This is the first danger to be guarded against. The patient should not spit upon the floor, carpet, wall, stove or anywhere except into a cup kept for the purpose. The cup should be one-third full of water and carbolic acid (*see* disinfectant solution No. I.). The water keeps the sputum moist and the carbolic acid kills the germs. The cup should be emptied into the water-closet twice a day and carefully washed afterwards each time with carbolic acid (Solution I.) followed by boiling water. If paper or paste-board cups are used the cup with its contents should be burned and a new one substituted. This is the best plan. Handkerchiefs used by the patient should be boiled in water for half an hour by themselves, and then washed each day. It is better to use worthless cloths and burn them, instead of boiling and washing. When away from home the patient should spit into the handkerchiefs or cloths. These should not be carried loose in the pocket, but in a tobacco pouch or other waterproof receptacle. On returning home the handkerchiefs should be boiled or the clothes burnt, and the pouch well washed with carbolic acid and water (*see* disinfectant solution No. I.).

Great care should be taken by the patient to prevent the hands, face, and clothing from becoming soiled with the sputum. The lips are particularly apt to become smeared with the sputum, and the hands also, when handkerchiefs are used. Both face and hands should be frequently washed with hot water and soap, followed by carbolic acid and water (*see* disinfectant solution No. II.). The kissing of consumptive patients is dangerous, especially to children.

The second source of danger is in the fine spray thrown off by the patient from the mouth in talking, coughing, laughing, sneezing, spitting, etc. The germs are present in this spray which floats about in the air and settles upon the furniture, etc.

The danger is not so great as from the dried sputum, but persons not having consumption run the risk of infection on this account if they remain long in a room used by a consumptive patient. No consumptive patient should sleep in the same room with any one else.

The third source of danger is from clothing and knives, forks, spoons, plates, cups, etc., used by the patient.

These should all be boiled in water after use. The patient's clothing, night-robes, sheets, pillow-slips, etc., should not be mixed with the general wash of the family, nor sent to a public laundry, but boiled for half an hour and then washed by themselves at home. Articles of food, especially milk, should not be used by the family after standing for any length of time in the room used by the patient.

Consumption is by no means always fatal, and, in the earlier stages, recovery often takes place. The room occupied by the patient should be as large, airy, and well lighted as possible. Carpets, curtains, and upholstery should not be used. If already in use they should be removed and disinfected. Floor rugs should be frequently taken up and exposed to sunlight for a day and then swept or beaten in the open air, and, at intervals, disinfected with steam. They should not be swept or beaten in the house. The floors, woodwork, furniture, windows, etc., should be wiped with a cloth wetted in a disinfectant solution, not swept or dusted. The bowl of the water-closet used by the patient should be washed each day with a disinfectant solution also. Male patients should not wear beard or mustache, but should be clean shaved.

If these directions are followed, but little danger of infection to the family will exist, and the patient will be in good circumstances for recovery. The patient should have nourishing food, plenty of fresh air and light, and occupation suited to the general condition of the disease. The patient should avoid swallowing the sputum, and should abstain from excesses of all kinds, alcoholic, etc.

#### DISINFECTANT SOLUTIONS.

*I. For sputum cups, and for washing furniture, woodwork, metal surfaces, floors, etc.*

Carbolic acid, half-pint ; Water, five quarts (label "poison").

*II. For washing hands and face :*

Mix one quart of Solution I. with one quart of water (label "poison").

*III. For steam disinfection and disinfection of rooms :*

Apply at Boston Health Department, 11 Old Court House, Boston.

After the removal of a patient from a house or room, disinfection will be performed by the Board of Health. The householder must notify the Board of Health of the removal of the patient within twenty-four hours.

#### REMOVAL OF OLD BUILDINGS.

Since the enactment of the law passed in 1897 and amended in 1899, for the removal of certain buildings in Boston, 209 have been ordered down by the Board of Health, 158 of these have been removed, and 15 have been allowed such alterations as would warrant the Board in rescinding its order for removal, and 36 are in process. The administration of this law calls for considerable care and conservative judgment to avoid injustice, hardship, and litigation. The Board has proceeded steadily with the work without much difficulty and without successful interference from any source.

## SCHOOL-HOUSES.

At the request of the School Committee an examination was made of the sanitary condition of all the school-houses. Upon completion of this work the following report was made :

HEALTH DEPARTMENT, OLD COURT HOUSE,  
BOSTON, March 26, 1901.

*To the Honorable School Committee, City of Boston:*

GENTLEMEN, — In compliance with your request, an inspection has been made of the sanitary condition of the public school buildings of Boston. Accompanying this communication we submit a detailed report of the condition of each school. A general summary of it is as follows :

*Ventilation.*

A large majority of the class-rooms are ventilated by shafts, without power, and are practically useless. In every case these shafts should be supplied with power to aid circulation. In some cases the power is provided, but is not made use of by the janitor in charge, and in one instance (the Hyde School, on Hammond street), the noise accompanying the running of the motor is so great that it cannot be used. In quite a number of the school-rooms the pipes which supply the fresh-heated air to the class rooms are located in the same rooms with the water-closets and urinals, and in some cases directly over them, and, as in a number of instances, the joints and slides are not tight, and the foul air is transmitted to the class-room above. In no instance should these fresh-air pipes be located in the same rooms with the sanitarries.

*Sanitarries.*

In a large number of the school buildings the old and offensive flush vaults remain, and are located either in the basement or in the yard near to the school building, and, in some cases, even the old privy vault still remains. In a number of instances the teachers' water-closets and sinks, throughout the building, discharge into the flush vault, in the basement or yard, as the case may be, and in one case (the Bennett Annex), the flush vault in the basement is discharged into the vault in the yard in the rear, and is used by the Bennett Grammar School, and as this is an overflow vault the fecal matter from two large schools remains in the bottom as in the old privy vault. This privy, like most of those located in the yards, is not supplied with heat, and in cold weather the contents of the vault are frequently frozen throughout the winter.

Those vaults should, without exception, be abolished. During the last few years a number of iron washout closets have been put in, and, in most cases, the troughs have been merely painted,

instead of being enamelled, in consequence of which condition they very soon become rusted, corroded and offensive. If these closets are to be used enamelled troughs should be provided in every instance.

The urinals in use in the schools throughout the City are, as a rule, offensive. A large number of the teachers' water-closets are long hopper or pan closets, and are located in dark and unventilated rooms. These should be replaced with short hopper tank supply closets and located where they will have outside light and air. A number of schools are provided with a system of cremating the excrement. This system should be abolished where there are sewers in the streets, and the drainage carried direct to the sewer. This recommendation applies particularly to the Bowditch School on Green street, of which complaints have been frequently made to this Board, and upon investigation these complaints were found to be justified; in a number of schools the roofs leak and the walls and ceilings need cleaning, painting and whitewashing.

In summing up, the Board of Health makes the following recommendations: First, that all ventilation shafts from class-rooms be provided with some power to aid circulation and make them constantly effective for the purpose for which they were intended. Second, that all flush and privy vaults be abolished; all long hopper closets, pan closets and iron washout closets be removed, and all these fixtures within the buildings be replaced by individual short hopper closets, in a place well lighted, heated, and ventilated.

Third, the individual earthen urinal should be provided in place of the urinals now in use.

Fourth, the Board of Health is of the opinion that, as far as possible, all water-closets and urinals for the pupils should be located in a separate building connected with the school building by a covered passageway, the whole to be well lighted, heated, and ventilated.

It should be said that the numerous defects found in the plumbing and draining systems, and the many calls for repairs and alterations, are not peculiar to our public school-houses, but are such as may be found sooner or later in nearly all classes of buildings, and, while the Board of Health does not expect that funds can be obtained for the immediate remedy of all the defects found in the school-houses, it hopes to see a candid recognition of such faults and a movement made toward their ultimate correction.

Very respectfully,

THE BOARD OF HEALTH,

(Signed)

SAMUEL H. DURGIN,  
*Chairman.*

## MEDICAL INSPECTION OF SCHOOLS.

There has been no material change to be noted in the prosecution of this work during the past year in Boston. This system of school inspection has gradually been adopted by other cities and States and is now generally recognized as 'most important in the early discovery and treatment of infectious diseases, and also in pointing out many other diseases and disturbing physical conditions in the public schools.

A review of this work by Mr. Edwin M. Seaver, Superintendent of Public Schools of Boston, in his last annual report gives a gratifying endorsement to medical inspection of schools as practised here. This review will be read with much satisfaction by those who are discussing the question of adopting the system in other places and by those who know the author of the report.

Mr. Seaver calls attention, with characteristic clearness, to the faulty condition of our laws pertaining to school attendance of children without vaccination and the return of children to school after recovery from infectious diseases. In 1894 our statute law concerning vaccination was amended so as to allow unvaccinated children to attend school if they could obtain from a physician a certificate stating that they were unfit for vaccination. The result has been that children in excellent health are being certified as unfit for vaccination and are in school without the precaution against small-pox, which the law formerly required. It is only a question of time, in our judgment, when the evil of the amendment will be realized in the presence of small-pox.

The subjoined table gives the results of school inspections :

**TABULATION OF REPORTS OF MEDICAL INSPECTORS OF THE SCHOOLS AND AGENTS OF THE BOARD OF HEALTH OF BOSTON FOR THE YEAR OF 1900.**

*List of Diseases found in the Schools.*

SUMMARY.

|                                         |        |
|-----------------------------------------|--------|
| Specific infectious diseases . . . . .  | 505    |
| Oral and respiratory diseases . . . . . | 2,609  |
| Diseases of the ear . . . . .           | 87     |
| Diseases of the eye . . . . .           | 431    |
| Diseases of the skin . . . . .          | 3,421  |
| Miscellaneous diseases . . . . .        | 3,568  |
| Found free from disease . . . . .       | 4,952  |
|                                         | <hr/>  |
|                                         | 15,573 |

|                                                                                            |        |
|--------------------------------------------------------------------------------------------|--------|
| Number of pupils examined in the schools . . . . .                                         | 15,573 |
| Number recommended to be sent home . . . . .                                               | 3,055  |
| Number consultations with teachers (about pupils re-<br>turning to school, etc.) . . . . . | 3,440  |

# I. — SPECIFIC INFECTIOUS DISEASES.

|                          |           |
|--------------------------|-----------|
| Diphtheria . . . . .     | 23        |
| Scarlet fever . . . . .  | 23        |
| Measles . . . . .        | 121       |
| Whooping-cough . . . . . | 62        |
| Mumps . . . . .          | 107       |
| Chicken-pox . . . . .    | 108       |
| Influenza . . . . .      | 50        |
| Erysipelas . . . . .     | 2         |
| Syphilis . . . . .       | 3         |
| Tuberculosis . . . . .   | 2         |
| Malaria . . . . .        | 4         |
|                          | <hr/> 505 |

# II. — DISEASES OF THE ORAL AND RESPIRATORY TRACT.

## 1. Mouth.

|                                     |    |
|-------------------------------------|----|
| Stomatitis:                         |    |
| (a) Simple (erythematous) . . . . . | 7  |
| (b) Aphthous (herpetic) . . . . .   | 1  |
| (c) Ulcerative . . . . .            | 1  |
| Alveolar abscess . . . . .          | 31 |

## 2. Pharynx.

|                                                           |     |
|-----------------------------------------------------------|-----|
| Acute pharyngitis . . . . .                               | 438 |
| Hypertrophic pharyngitis<br>(acute and chronic) . . . . . | 88  |

## 3. Tonsils.

|                                        |       |
|----------------------------------------|-------|
| Acute follicular tonsillitis . . . . . | 1,281 |
| Hypertrophic tonsillitis . . . . .     | 407   |
| Abscess . . . . .                      | 2     |

## 4. Uvula.

|                      |    |
|----------------------|----|
| Elongation . . . . . | 12 |
|----------------------|----|

## 5. Nose.

|                                |    |
|--------------------------------|----|
| Acute rhinitis . . . . .       | 47 |
| Chronic rhinitis . . . . .     | 5  |
| Purulent rhinitis . . . . .    | 2  |
| Ozaena . . . . .               | 7  |
| Deviations of septum . . . . . | 1  |
| Epistaxis . . . . .            | 17 |

## 6. Naso-Pharynx.

|                                                     |    |
|-----------------------------------------------------|----|
| Naso-pharyngitis (Post-<br>nasal catarrh) . . . . . | 33 |
| Adenoid disease . . . . .                           | 53 |

## 7. Larynx.

|                            |    |
|----------------------------|----|
| Acute laryngitis . . . . . | 51 |
|----------------------------|----|

## 8. Bronchi.

|                              |             |
|------------------------------|-------------|
| Acute bronchitis . . . . .   | 119         |
| Chronic bronchitis . . . . . | 1           |
|                              | <hr/> 2,609 |

# III. — DISEASES OF THE EAR.

|                                                        |          |
|--------------------------------------------------------|----------|
| Foreign bodies (cerumen,<br>etc.) . . . . .            | 1        |
| Otitis media, catarrhal,<br>acute . . . . .            | 12       |
| Otitis media, catarrhal,<br>chronic . . . . .          | 12       |
| Otitis media, suppurative,<br>acute . . . . .          | 6        |
| Otitis media, suppurative,<br>chronic . . . . .        | 46       |
| Imperfect hearing (without<br>visible cause) . . . . . | 10       |
|                                                        | <hr/> 87 |

# IV. — DISEASES OF THE EYE.

|                          |    |
|--------------------------|----|
| Foreign bodies . . . . . | 13 |
|--------------------------|----|

## 2. Eyelids.

|                       |    |
|-----------------------|----|
| Blepharitis . . . . . | 23 |
| Stye . . . . .        | 14 |
| Ptosis . . . . .      | 3  |

## 3. Lachrymal Organs.

|                               |   |
|-------------------------------|---|
| Obstruction of duct . . . . . | 4 |
|-------------------------------|---|

## 4. Conjunctiva.

|                               |    |
|-------------------------------|----|
| Conjunctivitis:               |    |
| (a) Acute catarrhal . . . . . | 88 |
| (b) Purulent . . . . .        | 2  |
| (c) Phlyctenular . . . . .    | 10 |
| (d) Granular . . . . .        | 13 |

## 5. Cornea.

|                                  |    |
|----------------------------------|----|
| Interstitial keratitis . . . . . | 3  |
| Ulcer . . . . .                  | 13 |
| Opacity . . . . .                | 7  |

## 6. Iris.

|                  |   |
|------------------|---|
| Iritis . . . . . | 3 |
|------------------|---|



| 7. Muscles.                                     |       | VI. — MISCELLANEOUS DISEASES.             |       |
|-------------------------------------------------|-------|-------------------------------------------|-------|
| Strabismus .....                                | 12    | Anæmia .....                              | 94    |
| Nystagmus .....                                 | 3     | Debility .....                            | 90    |
| Imperfect sight (without<br>visible cause.....) | 220   | Headache (habitual) .....                 | 206   |
|                                                 | 431   | Cervical adenitis .....                   | 163   |
|                                                 |       | Chorea .....                              | 14    |
|                                                 |       | Ulcer .....                               | 42    |
|                                                 |       | Deformities, spinal extrem-<br>ities..... | 7     |
| V. — DISEASES OF THE SKIN.                      |       | Sprains .....                             | 34    |
| Acne .....                                      | 17    | Fractures .....                           | 3     |
| Alopecia areata.....                            | 12    | Contusions .....                          | 40    |
| Dermatitis.....                                 | 86    | Wounds.....                               | 66    |
| Eczema .....                                    | 337   | Abscess .....                             | 39    |
| Erythema simplex.....                           | 18    | Dental caries (painful) .....             | 23    |
| Furunculus .....                                | 13    | Neuralgia .....                           | 34    |
| Herpes { simplex.....                           | 68    | Epilepsy.....                             | 6     |
| { zoster.....                                   | 8     | Rheumatism .....                          | 27    |
| Impetigo contagiosa....                         | 227   | Cardiac diseases .....                    | 20    |
| Pediculosis .....                               | 2,316 | Gastric diseases .....                    | 215   |
| Pemphigus.....                                  | 8     | Intestinal diseases.....                  | 14    |
| Pityriasis maculata et cir-<br>cinata .....     | 3     | Urinary diseases .....                    | 29    |
| Psoriasis .....                                 | 6     | Vaccinations (performed)...               | 501   |
| Purpura .....                                   | 2     | Certificates of vaccination..             | 1,855 |
| Scabies .....                                   | 42    | No disease.....                           | 4,952 |
| Seborrhoea .....                                | 24    | Unclassified.....                         | 46    |
| Tinea { favosa .....                            | 10    |                                           | 8,520 |
| { trichophytina.....                            | 162   |                                           |       |
| Urticaria.....                                  | 61    |                                           |       |
| Verruca .....                                   | 1     |                                           |       |
|                                                 | 3,421 |                                           |       |

Following is a list containing the names of the Medical Inspectors of schools:

#### MEDICAL INSPECTORS OF SCHOOLS.

- J. L. Ames, 72 Chestnut street, Brimmer School, Kindergarten, Parochial, Fayette-street School.
- H. D. Arnold, 188 Warren street, Roxbury High School, Lewis Grammar School, Primary, Quincy street; Primary, Monroe street; Primary, Winthrop street; Primary and Kindergarten, Warren street.
- S. H. Ayer, 318 Shawmut avenue, Franklin, Waite, Cook, Parochial, Cathedral, German Parochial.
- W. B. Bancroft, 597 Broadway, Hart, Capen, Bird, Parochial, Kindergarten.
- David N. Blakely, 200 Warren street, Mt. Pleasant avenue, Yeoman, Dearborn, Eustis street.
- W. S. Boardman, 57 Hancock street, Eliot, Ware, Freeman, Parmenter, North Bennet Kindergarten.
- J. P. Broidrick, 67 South street, J. P., West Roxbury High, Creighton street, Leo XIII. Parochial.

- J. S. Brownrigg, 16 Delle avenue, Parochial, Kindergarten.  
J. E. Butler, 310 Warren street, George Putnam, St. Joseph's Parochial, St. Francis' Parochial.  
A. B. Coffin, 555 Washington, Dorchester High, school in store on Washington street, Gibson on School street, Gibson on Morse street, Atherton, Glenway Primary, Glenway Kindergarten.  
R. M. Cole, 456 Broadway, Shurtleff, Lincoln, Clinch and Burnham.  
D. A. Collins, 11 Parmenter street, St. Mary's Parochial, St. Stephen's Parochial, Moon-street Public.  
W. P. Coues, 90 Charles street, Wells, Winchell, Poplar street, North Russell street, Chambers street Primary and Chambers street Kindergarten.  
J. T. Cutler, 20 Crawford street, Edward Everett, Harbor View, Savin Hill and Athenæum.  
J. G. Dearborn, 2 Wood street, Charlestown, Harvard, Harvard Primary and Common street Primary.  
Charles G. Dewey, 539 Talbot avenue, Minot, Bailey-street Primary, Henry L. Pierce.  
John Duff, 4 Dexter row, Warren, Mead street, Cross street and Charlestown High.  
D. G. Eldredge, 15 Monadnock street, Mather, Quincy-street Primary.  
Wm. H. Ensworth, 7 Chelsea street, E. B. Adams, Plummer Primary and Assumption Parochial schools.  
Theo. C. Erb, 551 Columbus avenue, Everett, Dwight, Rutland, Concord, Joshua Bates.  
Wm. E. Fay, 290 Commonwealth avenue, Hyde, Sherwin, Leon-street Branch, Parker-street Branch, Day Nursery.  
Wm. H. Grainger, 408 Meridian street, Chapman, Tappan, Parochial.  
E. M. Greene, 20 Mt. Vernon street, Bowdoin, Somerset, Sharp, Phillips, Grant, Baldwin on Chardon street.  
J. S. Greene, 1107 Washington street, Dor., Gilbert Stuart, Morton-street Primary, Stoughton, Tileston, Adams-street Primary.  
Lyman G. Haskell, 335 Centre street, Jamaica Plain, J. P. Lowell, Wyman street, Lucretia Crocker, Heath street, Centre street, Sunnyside street, Baptist chapel.  
F. A. Higgins, 22 Marlboro' street, Quincy, Winthrop, Primary, Way street; Primary, Genesee street; Primary, Tyler street; Dennison Kindergarten.  
E. M. Holden, 178 Huntington avenue, Comins, Martin.  
F. C. Jillson, Hastings street, W. Roxbury, Robert G. Shaw, Mt. Vernon street, Baker street.

- J. S. H. Leard, 16 Weld Hill street, Agassiz, F. H. Primary, Margaret Fuller, Primary, Bowditch, Hillside Primary, Chestnut avenue.
- Francis Magurn, 112 Main street, Charlestown, Frothingham and Moulton street Primary.
- H. E. Marion, 5 Sparhawk street, Brighton High, Bennett Grammar and Annex, Winship Primary, Union-street Primary and Kindergarten.
- O. H. Marion, 22 Harvard avenue, Harvard, Everett, Allston, Webster.
- Wm. J. McNally, 31 Monument square, Prescott, Medford-street Primary, Polk-street Primary.
- R. M. Merrick, 15 Adams street, Harris School, Dorchester-avenue Primary, Henry L. Pierce, Thetford-avenue Primary, Lauriat-avenue Kindergarten.
- G. P. Morris, 702 Broadway, Andrew, Ticknor, Roger Clap.
- T. J. Murphy, 372 Dudley street, Hugh O'Brien, George-street Primary, Howard avenue, St. Patrick's Parochial.
- J. F. O'Brien, 401 Bunker Hill street, Bunker Hill Grammar, Parochial.
- E. F. O'Shea, 5 Chelsea street, E. B., Lyman, High, Cudworth, Fitton.
- J. C. D. Pigeon, 130 Warren street, Dudley, Dillaway.
- H. L. Plummer, 728 Saratoga street, Emerson, Noble, Chapel on Bennington, Blackinton and Star of the Sea.
- H. S. Rowen, Bennett street, Bennett, Oak-square Primary, Warren Grammar, Faneuil Primary, St. Joseph's Academy, Allston, Auburn Primary.
- J. H. Sherman, 534 Broadway, Bigelow, Hawes, Simonds.
- C. M. Smith, 15 Charles street, Horace Mann, Prince, Perkins.
- Henry B. Stevens, 79 Park street, Longfellow, Charles Summer.
- F. W. Stuart, 550 Broadway, Norcross, Cyrus Alger, Drake.
- W. F. Temple, 240 Huntington avenue, Rice, Boys' Latin, Boys' High, Girls' Latin, Girls' High.
- H. F. R. Watts, 372 Dorchester, Gaston, Tuckerman, Pope, Kindergarten.
- Francis J. Weller, 580 Broadway, Lawrence, Mather, Howe, Parochial.
- Franklin W. White, 416 Marlboro' street, Hancock, Cushman, Parmenter street, Kindergarten, Sheafe street and Moon street.

## DIPHThERIA CULTURE STATIONS.

For the convenience of physicians, boxes containing culture tubes may be obtained of the following apothecaries:

## CULTURE STATIONS.

- William Draper, Sullivan square, Charlestown.
- Downey & McCormick, Thompson square, Charlestown.
- Clark & Mahoney, 101 Saratoga street, East Boston.
- A. W. Tilton, 71 Prince street.
- A. W. Tilton, Hanover and Parmenter streets.
- Henry Canning, 57 Chambers street.
- G. B. Squires, 113 Cambridge street.
- Theodore Metcalf, 39 Tremont street.
- C. J. Countie, 25 Charles street.
- Theodore Metcalf, Copley square.
- S. A. D. Sheppard, Dover and Washington streets.
- Frank S. Colley, 610 Tremont street.
- Fred L. Pratt, 575 Columbus avenue.
- W. D. Wheeler, Massachusetts avenue and Beacon street.
- W. F. Sawyer, 1152 Tremont street, Roxbury.
- Max Cramer, Columbus avenue and Roxbury Crossing.
- A. L. Gavin & Co., Warren and Regent streets, Roxbury.
- C. L. Brackett, Heath and Bromley streets.
- E. A. Woods, 281 Centre street, Jamaica Plain.
- Frank O. Ernst, 186 Lamartine street, Jamaica Plain.
- T. T. Reid, 3101 Washington street, Roxbury.
- C. B. Rogers, 701 Centre street, Jamaica Plain.
- S. T. Jeffers, 728 South street, Roslindale.
- F. O. Swallow, Centre street, West Roxbury.
- Thomas Joyce, 141 West Broadway, South Boston.
- G. H. Alexander, 100 Dorchester street, South Boston.
- James T. Jones, 855 Fourth street, South Boston.
- A. H. Copley, 45 Hancock street, Dorchester.
- Tessier Bros., Dorchester and Savin Hill avenues.
- Connelly & Davis, 1442 Dorchester avenue.
- F. M. Loring, 122 Harvard street, Dorchester.
- Connelly & Davis, 760 Washington street, Dorchester.
- W F. Greene, 573 Talbot avenue, Ashmont.
- Connelly & Davis, 64 Walnut street, Neponset.
- Fred W. Archer, Washington street, Dorchester Lower Mills.
- F. W. Moore, Cambridge street, Allston.
- G. W. Warren, 343 Washington street, Brighton.
- Geo. W. Walker, 648 Warren street, Roxbury.
- Chester Baker, 123 Massachusetts avenue, City.

C. P. Flynn, 586 Dorchester avenue, South Boston.  
Perry & Co., Norfolk and Cabot streets, Dorchester.  
Laboratory, Sudbury Building, Boston.

#### MORGUE.

The old City Morgue, which stood on North Grove street, and which had become practically useless by reason of age, lack of room and necessary facilities required in such a building, was removed in February, and with an appropriation at hand for the purpose we constructed a new building on the most modern and approved plans. The appropriation not being quite sufficient (as was known in the beginning) to finish and equip the morgue, a small additional appropriation was requested, but not yet received. It is considerably important that this building should be finished, equipped, and put into use as soon as possible, for there is now no public place for the necessary care of bodies at the North and West Ends of the City which must be prepared and held under appropriate conditions for identification and other legal uses.

#### UNDERTAKERS.

Appointed annually by the Board of Health in accordance with Pub. Stat. 1890, Chap. 210, Sect. 1.

#### LIST OF UNDERTAKERS, CITY OF BOSTON.

Abrams, Barnett, 4 Williams-street terrace, Roxbury.  
Alexander, Alexis, 100 Wayland street, Dorchester.  
Alexander, J. H., 610 Fifth street, South Boston.  
Avdon, Samuel, 67 Salem street, Boston.  
Badaracco, Andrew A., 11 North Bennet street, Boston.  
Balfe, Thomas J., 258 Broadway, South Boston.  
Banks, Walden, 170 Cambridge street, Boston.  
Barry, Michael, 371 Harrison avenue, Boston.  
Barry, William, 371 Harrison avenue, Boston.  
Belgard, Philip, 15 Arnold street, Roxbury.  
Bernstein, Morris H., 26 Parmenter street, Boston.  
Brady, Patrick J., 3694 Washington street.  
Briggs, Frederick L., 20 Howard street, Boston.  
Brown, Edwin G., 232 Meridian street, East Boston.  
Brown, Frank E., 252 Meridian street, East Boston.  
Bryant, Chas. A., 2 Woodstock avenue, Brighton.  
Bryant, John E., 15 Austin street, Charlestown.  
Bryant, T. Weston, 15 Austin street, Charlestown.  
Burke, Edmund C., opp. Jamaica Plain station.

Burke, John B., 75 Chambers street, Boston.  
Burroughs, Samuel M., 110 Dorchester street, South Boston.  
Callahan, Timothy F., 52 Warren street, Charlestown.  
Cangiano, Michael, 212 North street, Boston.  
Carpenter, Geo. S., 251 Tremont street, Boston.  
Caro, Solomon M., 19 Catawba street, Roxbury.  
Casey, Francis P., 56 Warren street, Roxbury.  
Cassidy, William J., 120 Harrison avenue, Boston.  
Celler, Gustave, 34 Hammond street, Boston.  
Chester, Charles E., Trinity Church, Boston.  
Cleary, J. P., 5 Pynchon street, Roxbury.  
Cobb, Charles W., 99 Main street, Charlestown.  
Cobb, Frank L., 97 Hyde Park avenue, Jamaica Plain.  
Cobe, William, 18 Worthington street, Roxbury.  
Colbert, Charles E., 144 Harrison avenue, Boston.  
Cole, Harry H., 9 Hancock street, Dorchester.  
Connell, Austin H., 815 Albany street, Roxbury.  
Cosmo, M. J., 12 Battery street, Boston.  
Crane, F. E., 565 Tremont street, Boston.  
Crane, Horace R., 25 Walnut street and 1859 Dorchester avenue, Dorchester.  
Crogan, James P., 87 Chelsea street, Charlestown.  
Crosby, Elizabeth A., 10 Warren street, Roxbury.  
Crosby, Joseph P., 100 Hampden street, Roxbury.  
Curtis, David H., 397 Dudley street, Boston.  
Dacey, C. M., 82 Main street, Charlestown.  
Dalzell, Fred W., Egleston square, Boston.  
Dolan, Chas. B., Dorchester avenue, cor. Richmond street.  
Dolan, James W., 1380 Dorchester avenue, Dorchester.  
Dooley, David J., 147 London street, East Boston.  
Doolin, John, 211 Third street and 245 Dorchester street, South Boston.  
Doyle, Thomas, 2212 Washington street, Roxbury.  
Eastman, Alman L., 251 Tremont street, Boston.  
Fallon, John D., 736 Centre street, Jamaica Plain.  
Farrell, Michael A., 1336 Tremont street, Boston.  
Feeley, Thomas, 128 Freeport street, Dorchester.  
Feeney, John, 364 Hanover street, Boston.  
Field, George V., 214 Dorchester street, South Boston.  
Field, Geo. P., 214 Dorchester street, South Boston.  
Fitzgibbon, Edward D., 1345 Dorchester avenue, Dorchester.  
Flax, Harris, 3½ Barton street, Boston.  
Gallivan, Joseph C., 204 Broadway, South Boston.  
Galvin, John I., Long Island.  
Gilmore, Edward J., 1455 Tremont street, Boston.  
Gleason, E. F., 345 Washington street, Dorchester.

Gleason, R., 345 Washington street, Dorchester.  
Guggenheim, Joseph, 111 West Brookline street, Boston.  
Haynes, John O., sexton Emanuel Church, Newbury street.  
Hill, George, South street, Roslindale.  
Hogue, Alphonse, 10 Isabella street, Boston.  
Hutchins, Basil, 726 Shawmut avenue, Boston.  
Jacobovitz, Myer, Centre street, West Roxbury.  
Jacobs, Louis, 110 Pleasant street, Boston.  
Jones, Lewis L., 50 La Grange street, Boston.  
Keating, Thomas J., 322 Bunker Hill street, Charlestown.  
Kelly, Bernard, 310 Bowdoin street, Dorchester.  
Kelly, Michael J., 37 Maverick square, East Boston.  
Lane, Thomas J., 120 Havre street, East Boston.  
Langone, Joseph A., 218 North street Boston.  
Lavery, Frank W., 54 A street, South Boston.  
Lavery, John W., 54 A street, South Boston.  
Leary, Lewis W., 146 Broadway, South Boston.  
Linnehan, C. P., 98 Kneeland street, Boston.  
Lippa, William, 19 Stillman street, Boston.  
Maloney, Frank S., 123 Maverick street, East Boston.  
Mann, Lewis A., 145 Dudley street Roxbury.  
Marsh, W. W., 475 Cambridge street, Brighton.  
Mannheimer, Herman, 1623 Washington street, Boston.  
McCaffrey, Christopher P., 75 Albany street, Boston.  
McCaffrey, John, 75 Albany street, Boston.  
McCartney, Timothy, 328 Bunker Hill street, Charlestown.  
McCugh, Hugh, 4278 Washington street, Roslindale.  
McKeon, John B., 615 Dorchester avenue.  
McMackin, Bernard, 80 Bunker Hill street, Charlestown.  
Metcalf, Eugene H., 24 Franklin street, Allston.  
Mitchell, M. J., 324 Bunker Hill street, Charlestown.  
Morris, Jerome S., 165 London street, East Boston.  
Morris, John J., cor. London and Porter streets, East Boston.  
Morris, Lawrence F., cor. London and Porter streets.  
Muldoon, Joseph L., Market street, Brighton.  
Mullen, James, 84 Charlestown street, Boston.  
Mullen, M. J., 650 Broadway, South Boston.  
Mullen, Patrick H., 650 Broadway, South Boston.  
Murdock, James E., 2048 Washington street, Roxbury.  
Murphy, Michael J., 428 Hanover street, Boston.  
Murray, E. A., 29 Thacher street, Boston.  
Murray, Frank A., 29 Thacher street, Boston.  
Nolan, John E., 380 Broadway, South Boston.  
O'Donnell, James F., 204 Broadway, South Boston.  
Peak, John H., 1374 Washington street, Boston.  
Peak, John H., Jr., 1374 Washington street, Boston.

Peyser, Jacob, 39 Hammond street.  
Porchella, Michael, 37 Tileston street.  
Rafferty, Patrick H., 60 Chambers street, Boston.  
Rafferty, Thomas E., 1034 Tremont street, Boston.  
Reade, George E., 263 Dover street, Boston.  
Reade, Vincent de P., 187 Main street, Charlestown.  
Reade, Vincent de P. Jr., 187 Main street, Charlestown.  
Regan, Martin, 1032 Tremont street, Roxbury.  
Ring, Timothy F., 205 D street, South Boston.  
Roach, Edward E., 191 Pynchon street, Roxbury.  
Roeder, John R., Henshaw street, Brighton.  
Roles, Roswell, 730 Shawmut avenue, Roxbury.  
Ruemker, Frank H., 296 Roxbury street, Roxbury.  
Silverstein, Myer L., 238 Hanover street, Boston.  
Slyne, William F., 249 Dorchester street.  
Smith, Prescilla M., 106 Dorchester street.  
Spencer, W. F., 204 Broadway, South Boston.  
Sprague, John W., 120 Meridian street, East Boston.  
Stanetsky, Jacob, 13 Wiget street, Boston.  
Stokes, Waldo J., Park street, West Roxbury.  
Sullivan, J. F., 358 Market street, Brighton.  
Sullivan, Samuel J., 545 Harrison avenue, Boston.  
Sullivan, T. J., 332 Broadway, South Boston.  
Tinkham, Charles F., 20 Howard street, Boston.  
Tinkham, Jeremiah, 20 Howard street, Boston.  
Tondorf, Joseph B., 129 Shawmut avenue, Boston.  
Vinal, Frederick, Deer Island.  
Walsh, John F., 91 Chelsea street, Charlestown.  
Waterman, Frank S., 2326 Washington street, Roxbury.  
Waterman, George H., 2326 Washington street, Roxbury.  
Watson, Bernard L., 52 Warren street, Roxbury.  
White, Harry M., 728 Dudley street, Roxbury.  
Whitman, Lewis H., 399 Cambridge street, Boston.  
Willard, George A., 110 Dorchester street, South Boston.  
Williams., N. M., 1386 Washington street, Boston.  
Wittenberg, Solomon, 66 Salem street, Boston.

#### STABLES.

Hearings were had on ninety-three applications for the occupancy of stables, with the following result: Fifty-one were granted, twenty-seven were refused, three were withdrawn by the petitioners, and twelve are awaiting action.

#### EXAMINATION OF PLUMBERS.

During the year ending January 31, 1901, 52 meetings were held by the Examining Committee, and 248 candidates for



plumbers' licenses were examined. Of these, 77 were for masters' licenses, and 42, or 54 per cent., passed the examination and were licensed. One hundred and sixty-nine were examined for journeymen's licenses, and of these 91, or 53 per cent., passed the written examination, and were notified to report for a practical test. Of the 91 candidates who passed the written examination, 74, or 81 per cent., passed successful examinations in the shop, and were given licenses.

#### EXAMINATION OF GAS-FITTERS.

The number of gas-fitters examined during the year ending January 31, 1901:

|                                                                                                        |     |
|--------------------------------------------------------------------------------------------------------|-----|
| Number of applications for licenses, referred by Building Commissioner to Board of Examiners . . . . . | 314 |
| Number of examinations held . . . . .                                                                  | 43  |
| Number of applicants examined by Board . . . . .                                                       | 229 |
| Masters . . . . .                                                                                      | 97  |
| Journeymen . . . . .                                                                                   | 132 |
| Number of applicants examined, certified by Board to Building Commissioner for license . . . . .       | 70  |
| Masters . . . . .                                                                                      | 34  |
| Journeymen . . . . .                                                                                   | 36  |
| Number of examination papers rejected, applicant not receiving requisite percentage . . . . .          | 159 |
| Masters . . . . .                                                                                      | 63  |
| Journeymen . . . . .                                                                                   | 96  |

#### PARIS EXPOSITION.

An invitation was received by the Board to send to the Paris Exposition of 1900 a series of photographs illustrating the work of the Health Department of Boston. The invitation was accepted, and the photographs furnished in due time. As will be seen by the following communication the Department was awarded a grand prize for its exhibition:

#### UNITED STATES COMMISSION

TO THE PARIS EXPOSITION OF 1900.

DEPARTMENT OF EDUCATION AND SOCIAL ECONOMY,  
20, AVENUE RAPP, PARIS, FRANCE, Oct. 24, 1900.

*Board of Health, Boston, Mass.:*

GENTLEMEN, — I hereby notify you that the revision of the awards granted by the International Class and Group Juries of the Paris Exposition of 1900 is completed by the Superior Jury, and the decisions now reached are final and official.

The exhibit of the Board of Health, Boston, Mass., in Class 111, Group 16, received a gold medal.

Yours very respectfully,

HOWARD I. ROGERS,

*Director of Education and Social Economy.*

Approved:

FERDINAND W. PECK, *Commissioner-General.*

## APPOINTMENTS.

May 1, 1900, Mr. Robert Cox, assumed the duties of Health Commissioner in place of Mr. George F. Babbitt, whose term of service expired on that date.

The Board organized on the first Monday in May by the choice of Samuel H. Durgin, M.D., as Chairman and Charles E. Davis, Jr., as Secretary.

February 1, Dr. F. H. Weller was appointed a Medical Inspector of schools in place of Dr. Tracey, resigned.

February 21, John McLoughlin was appointed Superintendent of Pedlers.

March 30, Dr. Lyman G. Haskell was appointed a Medical Inspector of Schools in place of Dr. A. H. Tompkins, resigned.

July 30, Burk R. Rickards was appointed Assistant Bacteriologist at the laboratory.

August 15, Miss Fidelia Fisk was appointed a stenographer in place of A. S. Ward, resigned.

September 22, Dr. Arthur W. Fairbanks was appointed a Medical Inspector of Schools in place of Dr. W. E. Fay, resigned.

January 14, 1901, Ethel M. Sutherland was appointed a stenographer and clerk.

January 31, 1901, Dr. David N. Blakely was appointed a Medical Inspector of Schools in place of Dr. Dewis, resigned.

SAMUEL H. DURGIN, M.D., *Chairman.*

EDWIN L. PILSBURY.

ROBERT COX.

## FINANCIAL STATEMENT.

EXPENSES FOR TWELVE MONTHS ENDING JANUARY 31,  
1901.

|                                                                            |             |
|----------------------------------------------------------------------------|-------------|
| Board of Health . . . .                                                    | \$12,500 00 |
| Clerk-hire . . . . .                                                       | 11,045 20   |
| Messenger . . . . .                                                        | 680 99      |
| Inspector of nuisances . .                                                 | 27,012 13   |
| Inspector at abattoir . . .                                                | 1,253 92    |
| Medical inspectors . . . .                                                 | 7,600 00    |
| Disinfection . . . . .                                                     | 18,881 77   |
| Small-pox hospital . . . .                                                 | 7,232 46    |
| Medical inspection of schools                                              | 9,830 00    |
| Vaccination . . . . .                                                      | 839 45      |
| Laboratory . . . . .                                                       | 8,179 20    |
| Nuisances and demolition of<br>buildings . . . . .                         | 2,652 42    |
| Morgue . . . . .                                                           | 1,331 75    |
| Postage . . . . .                                                          | 207 50      |
| Telephones . . . . .                                                       | 661 72      |
| Travelling expenses—officers,                                              | 1,481 94    |
| Office expenses . . . . .                                                  | 1,256 93    |
| Horse and Vehicle—Board<br>of Health and Medical In-<br>spectors . . . . . | 3,005 02    |
| Stationery . . . . .                                                       | 556 26      |
| Printing . . . . .                                                         | 6,046 36    |
| Advertising . . . . .                                                      | 105 92      |
| Examination of plumbers and<br>gas-fitters . . . . .                       | 707 50      |
| Quarantine . . . . .                                                       | 19,644 04   |
| Inspection of milk and vine-<br>gar . . . . .                              | 11,325 55   |
| Inspection of provisions . .                                               | 2,903 19    |
| Superintendent of pedlers .                                                | 2,140 14    |
| Other contagious diseases .                                                | 4 60        |

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\$159,085 96

## RECAPITULATION.

|                           |                   |
|---------------------------|-------------------|
| Appropriation . . .       | \$155,000 00      |
| Amount expended . .       | 159,085 96        |
|                           | <hr/>             |
| Excess of appropriation . | <u>\$4,085 96</u> |

## INCOME.

|                              |                   |
|------------------------------|-------------------|
| Quarantine . . . .           | \$5,465 00        |
| Inspection, milk and vinegar | 950 50            |
| Small-pox hospital . .       | 300 00            |
|                              | <hr/>             |
| Total . . . .                | <u>\$6,715 50</u> |

NUMBER OF PERSONS EMPLOYED IN THE HEALTH  
DEPARTMENT.

|                                                  | 1900<br>Feb. 1. | 1901<br>Jan. 31. |
|--------------------------------------------------|-----------------|------------------|
| Board of Health, 1 at. /.....                    | \$4,500 00      | \$4,500 00       |
| “ “ 2 at. ....                                   | 4,000 00        | 4,000 00         |
| Clerk-hire 1 at. ....                            | 3,000 00        | 3,000 00         |
| “ 1 at. ....                                     | 1,800 00        | 1,800 00         |
| “ 1 at. ....                                     | 1,700 00        | 1,700 00         |
| “ 2 at. ....                                     | 1,600 00        | 1,600 00         |
| “ 1 at. ....                                     | 1,200 00        |                  |
| “ 2 stenographers each at.....                   |                 | 520 00           |
| Medical Officers, 2 at. ....                     | 2,200 00        | 2,200 00         |
| “ “ 1 at. ....                                   | 1,800 00        | 1,800 00         |
| “ “ 1 at. ....                                   | 1,400 00        | 500 00           |
| Medical Inspectors of Schools, 49 at. ....       | 200 00          | 200 00           |
| Laboratory, 1 at. ....                           | 2,500 00        | 2,500 00         |
| “ 1 at. ....                                     | 660 00          | 900 00           |
| “ 1 at. ....                                     | 520 00          | 780 00           |
| “ 1 at. ....                                     | 156 00          | 156 00           |
| “ 1 at. ....                                     |                 | 280 00           |
| “ 1 at. ....                                     |                 | 676 00           |
| Sanitary Inspectors, 1 at. ....                  | 2,000 00        | 2,000 00         |
| “ “ 5 at. ....                                   | 1,800 00        | 1,800 00         |
| “ “ 3 at. ....                                   | 1,700 00        | 1,700 00         |
| “ “ 2 at. ....                                   | 1,600 00        | 1,600 00         |
| “ “ 1 at. ....                                   | 1,300 00        | 1,300 00         |
| “ “ 2 at. ....                                   | 1,200 00        | 1,200 00         |
| “ “ 4 at. ....                                   | 1,000 00        | 1,000 00         |
| “ “ 1 at. ....                                   | 400 00          |                  |
| Disinfecting Corps, 1 at. ....                   | 1,600 00        | 1,600 00         |
| “ “ 10 at. ....                                  | 820 00          |                  |
| “ “ 11 at. ....                                  |                 | 820 00           |
| Inspectors of Provisions, 1 at. ....             | 1,600 00        | 1,600 00         |
| “ “ 1 at. ....                                   | 900 00          | 900 00           |
| Superintendent of Pedlers, 1 at. ....            | 1,300 00        | 1,300 00         |
| “ “ 1 at. ....                                   | 936 00          | 936 00           |
| Inspectors at Abattoir, 1 at. ....               | 1,200 00        | 1,200 00         |
| Superintendent of Small-pox Hospital, 1 at. .... | 600 00          | 600 00           |
| Messenger, 1 at. ....                            | 600 00          | 600 00           |
| Bureau of milk, 1 at. ....                       | 3,000 00        | 3,000 00         |
| “ “ 1 at. ....                                   | 2,400 00        | 2,400 00         |
| “ “ 1 at. ....                                   | 1,500 00        | 1,500 00         |
| “ “ 3 at (per diem).....                         | 3 00            | 3 00             |
| Quarantine, 1 at. ....                           | 1,500 00        | 1,500 00         |
| “ 2 at. ....                                     | 1,200 00        | 1,200 00         |
| “ 1 at. ....                                     | 1,000 00        | 1,000 00         |
| “ 2 at. ....                                     | 780 00          | 780 00           |
| “ 2 at. ....                                     | 720 00          | 720 00           |
| “ 2 at. ....                                     | 540 00          | 540 00           |
| “ 1 at. ....                                     | 360 00          | 360 00           |
| “ 1 at. ....                                     | 300 00          | 300 00           |
| “ 2 at. ....                                     | 240 00          | 240 00           |
| “ 1 at. ....                                     | 216 00          | 216 00           |
| “ 1 at. ....                                     |                 | 624 00           |
| “ 1 at. ....                                     |                 | 275 00           |
| Morgue, Superintendent of.....                   | 360 00          | 360 00           |

## INVENTORY OF PROPERTY IN CHARGE OF THE BOARD OF HEALTH.

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Office No. 11 Old Court House, office furniture and records.

Bacteriological Laboratory, 607 Sudbury Building, furniture and scientific equipment.

Small-pox Hospital, Swett street —

One building used as a hospital.

One building used as a disinfecting plant.

One building for quarantining suspected cases of rabies in dogs.

Milk Inspection, office and laboratory at 994 Washington street, with chemical apparatus for the examination of milk and vinegar.

Old Morgue, North Grove street.

New Morgue, North Grove street, unfinished and unfurnished.

Disinfecting building in North Grove street for the storage of disinfectants — 5 horses, 5 wagons, 2 ambulances, 2 vans, 5 pungs, 44 regenerators.

Quarantine, steamer "Vigilant," with equipment.

Gallop's Island, with the following buildings etc.:

Rag shed for the disinfection of rags.

4 polling-booths.

2 detention houses.

1 bath-house.

Small-pox hospital.

Yellow fever hospital.

Overseer's house.

Barn.

Laboratory.

Carpenter shop.

Blacksmith shop.

2 wagons.

Ambulance.

Farming, carpenter and blacksmith tools.

2 horses.

3 cows.

## REPORT OF DIRECTOR OF BACTERIOLOGICAL LABORATORY.

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### *To the Board of Health :*

GENTLEMEN, — I have the honor to submit the following report for the year ending January 31, 1901 :

The first part describes the laboratory methods used in the routine diagnostic examinations of specimens from suspected cases of tuberculosis, diphtheria, typhoid fever, malaria, glanders, rabies, etc., and a brief outline of the principles involved in the interpretation and application of laboratory findings to every-day practice.

Mallein is now supplied free to veterinarians for use in cases of suspected glanders.

The second part of the report gives the results of the routine work, and of certain special investigations concerning disinfection by sulphur, infection of clams, etc., the relation of blank cartridge wounds to lockjaw, and arsenic in calamine.

The appendix contains most of the tables illustrating the work.

### PART I.

The laboratory is situated in the Sudbury Building, Sudbury and Hawkins streets, Boston.

*Hours for receiving Specimens.* — Specimens are received at the laboratory daily throughout the year from 8.30 A.M. to 6 P.M., except on Sundays and legal holidays, when the hours are from 8.30 A.M. to 10 A.M., and from 1.30 P.M. to 6 P.M.

*Transmission of Specimens.* — Outfits for specimens from *Tuberculosis*, *Diphtheria*, *Typhoid* and *Glanders* are kept at certain drug stores appointed for the purpose, and known as "culture stations." (See page 52.) *Malaria* outfits are supplied from the laboratory only. After the specimen is collected, it may be taken or sent directly to the laboratory. If preferred, specimens from cases of *Tuberculosis*, *Diphtheria* and *Glanders* may be returned to the station from which the outfits were obtained. They must not be mailed under any circumstances. If received at the culture station early

enough to reach the laboratory before 6 P.M., they are forwarded free to the laboratory the same day. *Typhoid* and *Malaria* specimens should not be left at the stations, but should be sent directly to the laboratory by mail. If special examinations are required the specimens should be sent by special messenger at the physician's expense.

*Examinations.*—The laboratory is open for examination of specimens from 8.30 A.M. to 5 P.M., except that on Saturdays the closing hour is 12 M., and on Sundays and legal holidays, 10 A.M.

*Reports.*—Early reports from the specimens submitted are of importance chiefly in the diphtheria diagnostic work. Everything else is subordinated to obtaining these results quickly. All positives for diagnosis, and all doubtful or unsatisfactory results where a second examination may be desirable are reported to the physician by telephone when possible. Negative results for diagnosis and cultures for release are not reported by telephone, except upon request. All results are reported to physicians by mail, whether telephoned or not.

The diphtheria results are usually available by 10 A.M., sputum and typhoid results by 11 A.M., and other examinations by 12 M. Telephone inquiries should not be made before these hours.

*Swab and Five-Hour Examination in cases of suspected Diphtheria.*—When requested, the laboratory is ready at all times during hours (9 A.M. to 5 P.M., Saturdays, 9 A.M. to 1 P.M., Sundays, 9 A.M. to 10 A.M.) to examine the *swabs* themselves from cases for *diagnosis*. It has been found that in about one-half of the cases finally proving positive after the ordinary incubation, a positive diagnosis can be made from the swab without waiting for incubation, thus saving from fifteen to twenty-four hours. A negative result from the swab is unreliable. In such cases, if the culture has been brought into the laboratory before 12 M., a *five-hour incubation* may be given, and reported on at 5 P.M., except on Saturdays, Sundays and holidays. A negative result from this examination also is unreliable, and the regular over-night incubation must then be proceeded with.

Positive results from the swab, the five-hour or the over-night incubation are equally reliable.

*Persons Eligible for Examination.*—Boston physicians may send cultures from patients resident within or outside of Boston. Physicians resident outside of Boston may send cultures from patients resident in Boston. When both physician and patient reside outside of Boston the cultures should be sent to the State Board of Health.



*Horses Eligible for Examination.* — Boston veterinarians may send preparations from horses whose owners are resident either within or outside of Boston. Veterinarians resident outside of Boston may send preparations from horses, the owners of which reside in Boston, or from horses stabled or working in Boston, although their owners are non-residents. If the veterinarian resides outside of Boston and the horse is stabled and works outside of Boston, preparations may be sent if the owner is a resident of Boston. Otherwise the preparations should go to the State Board of Cattle Commissioners.

### METHODS.

#### *Tuberculosis.*

*Outfits.* — For suspected tubercular sputum, square wide-mouthed bottles of about half an ounce capacity are supplied, contained in a pasteboard box and accompanied by a paper form, with directions on one side and on the other, blank spaces to be filled out by the physician with particulars of the case. To prevent infection of the laboratory from sputum, each bottle is sent out half-filled with 5 per cent. carbolic acid solution. The sputum is deposited in this solution and remains soaking there until it is examined. The carbolic acid not only kills the bacilli but also acts on them as a mordant, improving their staining qualities. On receipt of the outfit at the laboratory, the cover of the box is taken off and the whole outfit exposed to the vapor of formalin over night in a tight receptacle with the object of killing any bacilli scattered during the process of collection over the outside of the cork or bottle, etc.

No bottle containing sputum will be received for examination if leakage from the bottle during transit has occurred.

If the examination of urine for *B. tuberculosis* is desired, it is best to send to the laboratory the whole amount passed in 24 hours. Special precautions should be taken to prevent contamination with smegma or other foreign matter.

*Examination.* — The sputum specimens are examined usually on the morning following receipt.

Briefly, the examination consists in smearing the sputum upon a glass slide or coverslip, drying, staining with hot carbol-fuchsin, washing, decolorizing with a solution consisting of 3 per cent. of hydrochloric acid in 95 per cent. alcohol, washing again and counterstaining with methylene blue in aqueous solution. *B. tuberculosis* is stained red by this process, most other organisms blue or not at all. An apparatus was designed by Mr. B. R. Rickards, assistant

bacteriologist, for staining many specimens at once. A cut, with explanations, is appended.

#### AN APPARATUS FOR RAPIDLY STAINING LARGE NUMBERS OF SPUTUM SPECIMENS.<sup>1</sup>

The apparatus (Fig. 1) consists of a long narrow copper bath mounted on legs which are inclined and terminate at a broad base weighted with lead to ensure sufficient stability.

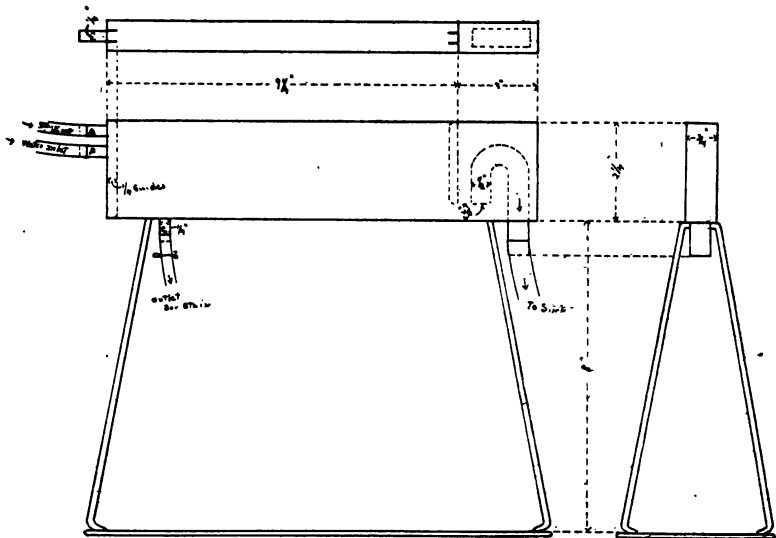


FIG. 1.  
Staining Bath for Sputum Specimens.

At one end near the top are two inlets; the upper one (A) for the admission of the stain, the lower (B) for water. In the bottom of the bath (at the same end) is a small outlet (C) for the stain, closed by means of a rubber tube and pinch-cock. At the other end of the bath, partitioned off by a false wall, is a one-half-inch siphon, the inner end of which is left at least three-eighths of an inch from the bottom to prevent the effect of capillarity. The top of the siphon is about on a level with the upper inlet. Guides are placed at each end of the bath proper. The bottom of the bath is eight inches above the base, allowing room for a Bunsen burner. The entire apparatus is nickel plated.

Instead of the ordinary small microscopic slide, a piece of thin plate glass (nine inches long by three wide) is used. It

<sup>1</sup> (The plates are used with the permission of the editor of the Journal of the Boston Society Medical Sciences.)

is etched with hydrofluoric acid as shown in the diagram. (Fig. 2.)

The etched area above the spacings furnishes a roughened surface on which the names of the patients can be written with lead pencil, or, better still, with a Faber blue pencil, made especially for writing on glass. This serves to identify the specimens. The slide slips easily into the bath, and is held upright by the guides at the ends. Since the slide is three inches wide and the bath but two and one-half deep, one-half inch of the slide projects above the top of the bath, furnishing a convenient means of handling it. Each slide has space for ten or twelve specimens. Thus thirty specimens or more can be stained at one time.

Carbol-fuchsin and Loeffler's methylene blue are used as the stain and counterstain, with 3 per cent. hydrochloric acid in 95 per cent. alcohol as the decolorizer.

The technique employed is as follows:

By means of a rubber tube and siphon attachment carbol-fuchsin is admitted from the stain bottle through the inlet

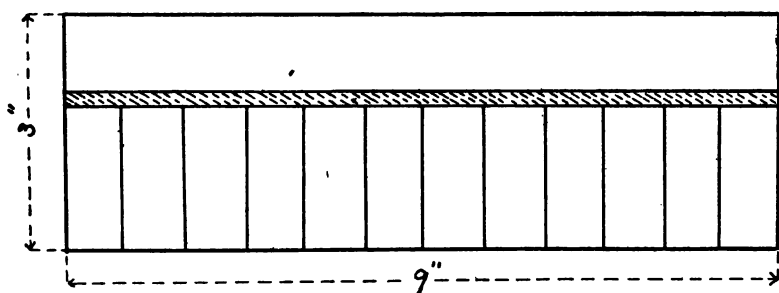


FIG. 2.  
Slide for Sputum Specimens.

(A) into the bath until it is about two-thirds full, or until the stain has reached the lower edge of inlet (B). This depth is sufficient to cover the preparations without starting the siphon.

An ordinary Bunsen burner with a wing tip may be used to heat the stain to the requisite temperature.

While the stain is heating, the specimens for examination are smeared and dried. The slide is then placed in the bath.

As soon as the specimens are stained sufficiently (about four minutes at 50° C. being used in this laboratory), the carbol-fuchsin is drawn off through outlet (C) into a bottle kept for this purpose. It is well to have the two stain bottles of the same size, so that when the one used for

receiving the stain becomes full, it can be exchanged for the one connecting with the inlet (A).

Water is then turned into the bath through the lower inlet (B). The bath fills until the top of the siphon is reached, then drains rapidly and almost completely, leaving but three-eighths of an inch of water in the bottom. The siphon breaks and the bath again fills and empties, and so on. By means of this intermittent filling and flowing the slide is washed quickly and completely, without requiring any further attention.

When the washing is complete the slide is taken from the bath, and the preparations decolorized. For this purpose is used a glass candy tray, which is a trifle over nine inches in length, and wide enough to contain two slides side by side. At the ends of this tray small strips of glass are cemented to the bottom. The slides are placed in the tray, specimen side down, the ends resting on the glass ledges. These ledges serve two purposes, — they prevent any scraping of the preparation by contact with the bottom of the tray, and they economize the decolorizer. The solution is drawn beneath the slide by capillarity, and can be made to flow back and forth by tilting the tray. Thus it is necessary to use but a very small quantity.

After decolorizing, the slide is again placed in the bath and washed. It is then withdrawn, dried, stained with methylene blue, and examined.

*Compulsory Notification* of pulmonary and laryngeal tuberculosis being now established in Boston, the receipt by the physician of a positive report from the laboratory makes it incumbent upon him to report the case to the Board of Health as tuberculosis.

#### *Interpretation of Results.*

*Positive Results.* — It is probable that very occasionally a few tubercle bacilli may be found in the mouths of healthy persons, but persons suffering from any affection of the lungs, larynx, etc., and presenting also the tubercle bacillus in their expectoration may safely be considered as suffering from the disease.

*Negative Results.* — A single negative result does not demonstrate the absence of the bacilli from the particular specimen of sputum examined, nor, if that absence be confirmed by subsequent examinations of successive specimens, is the absence of the disease necessarily established. A negative result from a patient suffering from consumption may

depend on (a) improper collection of specimen, saliva being taken instead of true pulmonary expectoration; (b) the presence of but few bacilli, — the microscopic examination being unreliable for the detection of very small numbers; (c) the absence of the bacilli from the sputum notwithstanding the presence of the disease. This latter is to be expected when there is little or no breaking down of the lung tissue as in the early stages of chronic consumption and sometimes throughout the course of acute miliary tuberculosis.

A clinical diagnosis of tuberculosis, pulmonary or genito-urinary, should not be reversed upon a single negative result. The error described under (b) may be eliminated by repeated examination, but it is a question whether even a dozen negative sputum examinations should be allowed to offset well-marked clinical indications in such cases as are given under (c).

In certain cases, injection of guinea pigs is necessary to reach a final decision, but the results are then available only after four to twelve weeks.

### *Diphtheria.*

*Outfits.* — One serum tube, one swab tube containing two swabs, a card to be filled out by the physician with the particulars of the case, and a paper giving directions, are enclosed in a pasteboard slide box, which is disinfected in formaldehyde gas each time before being sent out. Before taking an outfit from a culture station the serum should be inspected, and if dry or bad, rejected. *For diagnosis*, one swab *may* be used for the nose and one for the throat, both being inoculated on the same serum tube. *For release*, this procedure *is required* by a regulation of the Board of Health. If it is desired to obtain *for diagnosis* separate results from the nose and the throat, two outfits should be used, the nose swab being inoculated on one serum, the throat swab on the other, but nothing is gained by taking *separate* nose and throat cultures *for release*. When a rapid or swab examination for diagnosis is contemplated, it is well to rub the swab on the suspected area in the nose or throat a second time *after* the inoculation of the serum. The swab is then returned directly to the swab tube. This procedure increases the reliability of the swab results by increasing the amount of material made available for examination.

*Incubation.* — All diphtheria cultures received up to 6 P.M. are placed in the incubator at 37°C over night for examination at 8.30 A.M. the next day.

*Release.*—By a regulation of the Board of Health, two consecutive negative cultures from both the throat and nose are required from each case reported as diphtheria before isolation is officially terminated and disinfection performed. In all cases the second of these cultures must be taken by the medical agent of the district in which the patient resides.

When the first negative for release is obtained the proper medical agent is notified by telephone from the Board of Health (Old Court House) to take a culture. Should this prove negative, it constitutes the required second negative, and the patient is then released.

Should the agent's culture be positive, as it is in about one-third of the positive cases, a first negative must again be obtained and be followed by a second negative in order to secure the two *consecutive* negatives required.

*Removal of Cases to the City Hospital.*—By arrangement with Dr. J. H. McCollom, any case on which a positive result is reported from this laboratory will be accepted at the City Hospital as showing the presence of diphtheria bacilli, and will only be discharged on obtaining the regular release cultures. Under this agreement a report on all the positive cultures obtained in this laboratory each day is forwarded to Dr. McCollom. The isolation of well persons carrying diphtheria bacilli is not involved, however, in this agreement. When the hospital is crowded preference will be given to membrane cases.

*The Interpretations of Bacteriological Findings in the Diagnosis of Diphtheria.*—The most satisfactory definitions and nomenclature of bacterial diseases are based, not on clinical characteristics merely, but on the presence and activity of specific bacterial toxins,—those poisons formed only by the specific bacteria of the disease in question. *Under this conception the disease of diphtheria exists always, and exists only when the body shows a reaction to toxins formed by the diphtheria bacillus.* Bacterial diseases are in brief toxicological diseases, due to poisoning by chemical compounds of a peculiar kind—just as are the chronic diseases caused by lead, arsenic, etc., or acute attacks due to morphine, strychnine, etc. A clinical condition known to be due to the action of lead, whether mild or severe, and whatever the particular symptoms shown, is properly classified as plumbism. So also a clinical condition, due to diphtheria toxins, whether mild or severe and whatever the particular symptoms shown, is properly classed as diphtheria. This classification is not only theoretically correct but is important from the therapeutic standpoint, indicating the

proper treatment as well as the sequelæ and complications to be expected, and from the public health standpoint as indicating the nature and infectiveness of the disease. A merely clinical classification, based on anatomical features alone, cannot be relied on to indicate any one of these important features. Unfortunately there is no generally applicable and reliable method for detecting *both* the presence and activity of diphtheria toxins.

The detection of the diphtheria bacillus is used as an indicator of the *presence* of the diphtheria toxins. It is not absolutely reliable, for the diphtheria bacillus does not always produce its toxins. But even the presence of the toxins (if determined by subsequent guinea-pig tests) does not necessarily indicate their actual activity. The body forces tend to neutralize these toxins, and sometimes neutralize them completely. If the patient presents symptoms clearly those of diphtheria poisoning, both the presence of the toxins and their activity may be inferred. If the symptoms are indefinite, the presence of the diphtheria bacillus may be assumed to show the presence of diphtheria toxins; and the existence of symptoms, indefinite though they be, may be assumed to result from the activity of the toxins. It is true that diagnoses based on these assumptions are not always correct, but the percentage of error is much smaller than that of unaided clinical diagnosis.

If the person from whom a positive culture is obtained presents no symptoms of any kind, either the absence of the toxins or their complete neutralization—it does not matter which, so far as the patient is concerned—may be inferred. Such a person certainly is not suffering from the *disease* of diphtheria. But so long as diphtheria bacilli remain in his nose or throat he constitutes a nucleus from which the bacilli may be distributed to others.

*The absence of the diphtheria bacillus* is, on the other hand, absolute proof of the absence of the disease,<sup>1</sup> since diphtheria toxins are not formed except in the presence of diphtheria bacilli. The difficulty lies in proving absolutely that the bacilli are, in fact, absent. If absent from the nose and throat they will not, of course, appear in the cultures therefrom. But even when present in the nose or throat they do not always appear in culture,—that is, if only one culture be taken. Indeed, two or three, or even four negative cultures may occasionally be taken from throats carrying the bacilli. This is especially true of pure laryngeal cases where

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<sup>1</sup> Laboratory experiments with toxins are of course, not here included.

the seat of lesion is not readily reached. Hence, while one negative culture is of some value, two, three or four should be taken in suspicious cases before rejecting a clinical diagnosis of diphtheria on the bacteriological results alone.

*No Growths.*—This is a laboratory term used to designate any culture which for any reason (usually because the serum is too dry or has been liquified by contaminating bacteria) does not yield material satisfactory for examination.

*A Negative Report, Accompanied by a Request for Another Culture* is sent whenever a negative result is obtained from a case clinically diphtheria (as indicated by the physician's diagnosis) or from a case showing membrane on pharynx and tonsils, or from a laryngeal case, or from a case yielding bacilli of doubtful identity.

*Tests for Virulence.*—These are made on request in cases where patients recovered from diphtheria are kept in isolation for extended periods on account of diphtheria bacilli in the nose or throat. If the bacilli prove non-virulent, release is granted without waiting for two consecutive negatives.

*Virulence and Toxicity.*—The ordinary pathogenic bacteria are capable of producing both within and outside of the living tissues substances which are poisonous to those tissues.

Certain bacteria, however, while incapable of producing poisons within the tissues may be able nevertheless to produce outside of the tissues substances which, should they reach the tissues, may act as poisons upon them.

It is a question whether any bacterium exists capable of producing poisons within the tissues, but incapable of producing them outside the tissues. Certain organisms seem to present this character, but the evidence is far from complete.

The ability to grow and produce poisons within the living tissues is termed virulence. The ability to grow and produce poisons outside of the living tissues is termed toxicity. The ordinary pathogenic bacteria, including the diphtheria bacillus, are both virulent and toxic, although individual diphtheria cultures vary in virulence and toxicity and some diphtheria cultures possess neither. A test for virulence requires simply the introduction of the living bacillus into the living tissues. If the bacillus survives, grows, and produces a sufficient quantity of toxins, and, if the body fails to neutralize the latter, the body will present more or less typical lesions. It is evident, however, that a test for virulence is qualitative only. The number of bacilli injected cannot readily be measured, and much less the rate of their subsequent growth or rate of



toxin production. Hence not even a vague idea of the amount of toxins formed can be had nor of their relative intensity.

A test for toxicity is a different matter, and in the case of the diphtheria bacillus a more delicate indication of low grades of virulence. The bacilli are grown outside of the body in liquid media, from which the bacilli are removed by filtration. A fairly stable chemical mixture, capable of accurate measurement, is thus secured and comparative amounts of poison can be definitely expressed in terms of "grams of guinea-pigs killed by milligrams of toxic media used," or in other ways. For practical public health purposes relating to isolation and release, it is sufficient to know that a given diphtheria culture is or is not virulent or toxic. The determination of the exact degree of toxicity is not as yet considered of practical moment, since a bacillus of low toxicity in great numbers or attacking an individual of low resistance may be as harmful as a bacillus of high toxicity, in small numbers or attacking a person of high resistance.

### *Typhoid Fever.*

The dried-blood method for the Widal reaction is used.

*Outfit.* — This consists of aluminum foil, on which the blood is to be dried, and a small copper wire loop for transferring the blood to the foil. With this foil is a card, to be filled out by the physician, and a circular of directions. All three fit into a manila envelope for safe keeping. After the physician has taken the blood preparation it is returned to the laboratory by mail, postage two cents.

*Examination.* — The dried blood is mixed on the foil with ten times as much sterile water; a drop of this dilution is mixed on a coverslip with a drop of broth containing typhoid bacilli, making a total dilution of one in twenty. This preparation, mounted as a "hanging drop," is observed at intervals under the microscope for from thirty minutes to one hour. If loss of motility only, or clumping only, occurs, the preparation is called atypical, and another requested. If both occur, a positive, and if neither, a negative report is sent. A new typhoid culture on agar, reaction + 15 (1.5 per cent. acid) is made every day from a previous agar culture one month old. This ensures that there shall always be an agar culture one month old in the laboratory. From this month-old agar a broth culture also (+ 15 initial reaction) is made every day, and is ready for use next day after incubation for twenty-four hours at 37° C.

*Interpretation of Results of Widal Test in Typhoid Fever Diagnosis.* — The Widal reaction occurs in blood as one of the results of the reaction of the body forces to the toxins of the typhoid bacillus. It may be obtained from rabbit's blood within three or four days after injecting the rabbit with living or dead typhoid bacilli. In such rabbits the reaction is not necessarily or usually associated with the lesions, intestinal or otherwise, characteristic of typhoid fever in the human. Nor is it essential that the human patient should have the ordinary symptoms, etc., of intestinal typhoid fever in order to develop a reaction. It is sufficient that the human patient should suffer from the effects of the typhoid bacillus toxins, whatever clinical or anatomical conditions may accompany them. Moreover, once developed, the reaction may last for years after recovery, although usually it disappears within a few months. The presence of the reaction in the human means then the existence at some time past or present of an infection with the typhoid bacillus (Cabot)—*usually*, but not *necessarily*, an infection taking the form of ordinary intestinal typhoid fever.

*To interpret a positive report properly* the physician must know whether such a previous infection existed, and how long before, if at all. If there is a clear and reliable history of freedom from anything resembling typhoid fever previous to the attack, it may be usually assumed with safety that no previous typhoid infection existed, and that the Widal reaction obtained developed during the present attack. One source of error lies in the fact that reliable histories regarding typhoid fever cannot always be obtained, and that in any case a slight or obscure typhoid infection, other than intestinal, might have existed without recognition as "typhoid."

*A negative Widal reaction* is of little or no significance. The Widal reaction does not develop in the human before the fifth day usually, may not develop until late in the disease, and is not constantly present after development, so that a negative result may be interposed between two positives. It is easy to see that a patient might have typhoid fever and with it the Widal reaction present on certain days of the attack and yet that, by a coincidence, all the blood for the test might be taken on "off" days,—days on which no Widal reaction could be obtained. While this *possibility* should be remembered, it is not *likely* to be encountered if several successive specimens be taken. *An atypical reaction* means nothing. The subsequent reactions may be positive or negative.

*Malaria.*

*Outfit.* — This consists of a small flat tin box, which contains half-a-dozen clean coverslips wrapped in paper. On application to the laboratory, one such box, accompanied by a circular of directions and a card to be filled out with the particulars of the case by the physician, is mailed to the address given. The outfit should be returned to the laboratory by mail.

*Examination.* — Upon receipt of the coverslips, with the blood smeared on them as directed, the examination is carried out. The greatest care should be exercised to obtain a *thin even smear of blood upon the coverslip*. Better and more satisfactory results can be obtained by the examination of *fresh undried* blood. The physician places a *small* drop of blood on a slide, quickly drops a coverslip upon it, and at once seals the coverslip to the slide with a little vaseline carefully applied to the whole circumference of the coverslip. This preparation must be taken to the laboratory at once by a careful person, who is directed not to disturb it in any way.

*Glanders.*

*Outfit.* — This consists of a cylindrical copper box containing an eight-inch test tube, a card for particulars of the case and a circular of directions. The test tube contains a large swab of a design similar to that used for the diphtheria work. The outfits are sterilized each time before being sent out. The object to be sought by the veterinarian is the accumulation in the cotton of as much as possible of the suspected material from the nasal discharge or ulcers of the suspected horse.

*Examination.* — On receipt of an outfit at the laboratory the swab is transferred to 5 c.c.'s of sterilized water and shaken thoroughly in it. The resulting suspension is inoculated intra-abdominally into well-grown male guinea-pigs, and a positive or negative diagnosis is based upon the development or non-development of testicular lesions within seven days, after further examination of the testes, when enlarged, for the isolation of the organism.

*Interpretation of Results of Guinea-Pig Test.* — On injecting a guinea-pig with the emulsion obtained from a swab taken from a suspected horse, a mixture of organisms is usually introduced into the peritoneal cavity, especially if the preparation comes from the horse's nose. This mixture may or may not contain the glanders bacillus. If the glanders bacillus is not present, nor any other pathogenic organism

in sufficient numbers or of sufficient virulence to produce death, the guinea-pig, after a few hours or days of depression, recovers completely. If the glanders bacillus be present, and the other organisms also present fail to kill, the typical scrotal lesions or the peritoneal lesions will develop, the former usually within twenty-four to seventy-two hours, the latter later on. (For description of these lesions see Annual Report of 1899.) If, however, acute septic organisms be present in the injected liquid, the guinea-pig is likely to die within twenty-four hours, whether the glanders bacillus be present or not, and before the glanders lesions have time to develop. In these cases the test is evidently of no value, and should be repeated.

The following summary of the relation of the guinea-pig result to the diagnosis in the horse may be given :

Guinea-pig inoculation *positive* (scrotal or peritoneal lesions, with isolation of the glanders bacillus) — lesion in horse positive (glanders).

Guinea-pig inoculation *negative* (guinea-pig survives without lesions) — lesion in the horse negative (not glanders).

Guinea-pig inoculation *unsatisfactory* (guinea-pig dies within a short time, without development of typical lesions and without isolation of glanders bacillus) — lesion in the horse undetermined (no diagnosis).

It must be remembered that a negative diagnosis may occasionally be obtained from a lesion in the horse, due to the glanders bacillus, but from which the glanders bacillus has disappeared, or in which has been outgrown by other organisms. In some cases a faulty technique in collecting the specimen may have existed. Moreover, a negative result may be obtained, and be correct, from one lesion in a horse, whereas another lesion may yield a positive result, the first lesion in such cases being due to other causes than glanders, notwithstanding that the horse was infected with glanders at the time. Thus more than once a negative result from an ulcer on the leg has been accompanied by a positive result from the nose of the same horse.

*Swab Examinations, and Cultures Direct from the Swab.* —

Occasionally a direct microscopic examination of the material obtained from the suspected horse will show an organism which is indistinguishable from the glanders bacillus. A diagnosis can rarely if ever be made by this method, since the glanders bacillus presents no morphological characters so distinctive as to permit of its absolute recognition under the microscope alone. In some cases also a direct inoculation

on potato from the swab will result in the development of typical glanders colonies. This is a reliable method if the glanders bacillus be isolated, but unfortunately rarely succeeds in practice.

The results of the Glanders diagnostic service will be found in the Appendix to this report.

### *Rabies.*

*Collection of Specimen.* — Dogs or other animals suspected of rabies should not be killed, but should be confined securely, and notification sent to the Veterinarian of the Board of Health. If the animal is dead the whole carcass should be preserved, and notification sent as above. Failing this the head at least should be kept for examination.

*Examination.* — Rabies is examined for by injecting under the dura (exposed by trephining) of a full-grown rabbit one half a c.c. of an emulsion consisting of about one gram of the brain or spinal cord from the suspected animal in 10 c.c.'s of sterile water, filtered through absorbent cotton and paper. The trephine hole is just posterior to a line joining the centres of the eyes. Paralysis or convulsions developing after fourteen days, followed by death, is good evidence of the presence of rabies, if other infections can be excluded by a careful autopsy of the rabbit, with cultures from blood and organs. Two rabbits at least should be inoculated with the same material in each case.

*Rapid or Histological Method.* — Suggested by Babes, 1892, and confirmed as reliable by Van Gehuchten and Nelis, this method consists in rapid hardening, cutting, staining, mounting and direct microscopic examination of the bulb of dogs, etc., suspected of the disease. The method has been lately further discussed by Ravenel and McCarthy (Path. Soc. Phil. Journ. 1901, Univ. Med. Magazine). Van Gehuchten and Nelis found the lesions more marked in the intervertebral ganglia and in the plexiform ganglia of the pneumogastric than in the bulb. Ravenel and McCarthy fix in 10 per cent. formalin, transfer to 95 per cent., and then to absolute alcohol, cutting after freezing or embedding in celloidin or paraffin.

The sections are stained with hematoxylin and eosin. It appears that the lesions are best developed in the animals *dead* of natural or street rabies. If killed in the early stages of the attack the lesions are less characteristic, but more so in the ganglia than in the bulb. When the lesions are present, rabies may be inferred; when absent, rabies cannot be entirely excluded. A rabbit inoculation should be made also.

*Influenza.*

Influenza is examined for by direct staining of nasal or bronchial discharges, and by cultures from these regions and from the blood on glycerine agar, on the surface of which sterile human or pigeon's blood has been smeared. Sputum, etc., for examination, should be sent to the laboratory in small sterile wide-mouthed bottles, properly stoppered and labelled.

*Other Examinations.*

Any disease of a bacteriological nature will be examined free of charge. Before collecting specimens from diseases other than those already enumerated, communication should be had with the laboratory.

The examination for *B. pestis bubonicae* was described in the last annual report.

*Preparation of Media.*

This, a very important part of bacteriological work, was discussed in the report of 1898. It is sufficient to say here that the methods then employed have been continued without change.

A table is appended, showing the method in use for making the three principal media, other than Löffler's serum :

### Method for Making Nutrient Broth, Nutrient Gelatin and Nutrient Agar.

|                                                                                                                                         |                                         | Boil thirty grams thread Agar in one litre of water for half an hour. Make up to a weight of 1,000 grams.<br><i>Cool and solidify, or use hot if preferred.</i> |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NUTRIENT BROTH.                                                                                                                         | NUTRIENT GELATIN.                       | NUTRIENT AGAR.                                                                                                                                                  |
| 1. Infuse lean meat 20 hours with twice its weight of distilled water in refrigerator.<br>Say 1,000 grams meat.<br>" 2,000 grams water. | Ditto.                                  | Infuse lean meat 20 hours with its own weight of distilled water in refrigerator.<br>Say 1,000 grams meat.<br>" 1,000 grams water.                              |
| 2. Make up weight of meat infusion (and meat) to original weight by adding water, <i>i.e.</i> , to 3,000 grams                          | Ditto.                                  | Ditto.<br><i>i.e.</i> , to 2,000 grams.                                                                                                                         |
| 3. Filter infusion through cloth to remove meat.                                                                                        | Ditto.                                  | Ditto.                                                                                                                                                          |
| 4. Titrate and record reaction of filtrate. Say reaction $+2.2\%$ .                                                                     | Ditto.                                  | Ditto.<br>Say reaction $+4.2\%$ .                                                                                                                               |
| 5. Weigh filtered infusion. Say 1,800 grams.                                                                                            | Ditto.                                  | Ditto.<br>Say 900 grams.                                                                                                                                        |
| 6. Set infusion on water bath, keeping temperature below $60^{\circ}\text{C}$ .                                                         | Ditto.                                  | Ditto.                                                                                                                                                          |
| 7. Add peptone, 1 %, 18 grams, salt, .5%, 9 grams.                                                                                      | Ditto and sheet gelatin 10%, 180 grams. | Add peptone, 2%, 18 grams, salt, 1%, 9 grams.                                                                                                                   |
| 8. After ingredients are dissolved, titrate; reaction probably $+2.3$ to $+2.5$ .                                                       | Ditto.<br>Prob. $+4.0$ to $+5.0$ .      | Ditto.<br>Prob. $+4.5$ to $+4.7$ .                                                                                                                              |
| 9. Neutralize, Fuller's method.                                                                                                         | Ditto.                                  | Ditto.                                                                                                                                                          |
|                                                                                                                                         |                                         | 'To the 900 grams of meat infusion (containing now peptone and salt) add 900 grams of the 3% Agar jelly described at the head of this column.                   |

10. Heat over boiling water (or steam) bath thirty minutes.

11. Restore weight lost by evaporation to original weight of filtered meat infusion, for broth and gelatine, and to *twice* that weight for agar — to 1,800 grams in *each case*.

12. Titrate, reaction probably  $+0.3$  to  $+0.5$  per cent.

13. Adjust reaction to final point desired, say  $+1.5$  per cent.

14. Boil five minutes over free flame, with stirring.

15. Add water, if necessary, to make up loss by evaporation, to 1,800 grams.

16. Filter through absorbent cotton, passing the filtrate through the filter repeatedly until clear.

17. Titrate to determine whether or not the desired reaction has been maintained.

18. Tube and sterilize.

For methods of titration see Journal Am. Pub. Health Ass'n, October, 1895, and January, 1898. Also, Massachusetts State Board of Health, 1895; Fuller and Copeland.

### *Storage of Media.*

Media of all kinds are kept for use, ready tubed, in square wire baskets, which the writer finds most convenient when not more than four inches deep, the tubes being five and six inches long. This ensures the projection of the tubes above the top of the basket and makes their handling more easy. Each basket is labelled with the name of the medium (broth, plain agar, glycerine agar, etc.), the date of its preparation and a number corresponding with the records kept of its preparation. An excellent label consists of a small piece of aluminum foil attached to the basket by a wire ring. The name can be written on the foil with the blue Faber pencils used for writing on glass. These labels have the advantage that they will pass through the steam sterilizer without effacement. The baskets of media are kept in a refrigerator. The writer finds that drawers with perforated sides and bottoms, fitted into the lower part of an ordinary refrigerator, make the most convenient method of storage. When tubes are removed from any basket for use, the name of the medium and its number is copied from the aluminum label on the test tube label. Thus every culture made carries with it a reference to the records showing when and how the medium was prepared, its exact composition, etc.

### *Preparation of Mallein.*

Ordinary nutrient broth, to which has been added five per cent. of pure re-distilled glycerine, is used. The reaction is adjusted to + 15 (1.5 per cent. acid) and the broth is then sterilized in litre flasks, about 400 to 500 c.c.'s. in each flask. After incubation at 37° C. for three days to test sterility, each flask is weighed with the broth it contains and the weight recorded. The weight of the flask being known the weight of the broth is easily ascertained.

*B. mallei*, grown on plain nutrient agar at 37° C. for forty-eight to seventy-two hours, is inoculated into each flask, preferably by rubbing the loopful of bacilli on the



inside of the flask wall at the upper level of the broth, in order to secure the formation of a surface pellicle. Melted paraffin is then poured on the surface of the cotton plugs after burning them down to the level of the flask mouth, and the flasks are incubated at 37° C. for four to six weeks. The surface pellicle should begin to develop in two or three days, but sometimes requires a week or ten days. It appears as a white, moist, opaque viscid mass at the edge of the upper level of the broth, which by that time is cloudy with the growth of the bacilli. It develops by extension from this mass, or sometimes by detached islands of membrane floating on the surface. These are flat and semi-transparent, resembling films of paraffin at first, but soon increase in diameter and become whitish, opaque and wrinkled, simulating somewhat the surface pellicle formed by *B. subtilis*. At the end of the period specified most of the membrane has usually disappeared, breaking up and settling to the bottom of the flask.

The mallein cultures are then concentrated by boiling to one-half the original weight, cleared by adding white of egg, (the writer's method) filtered through a porcelain or Berkenfeldt bacterial filter, sterilized, filled into sterilized bottles containing one or two c.c.'s. each and again sterilized. They are then ready for use. One-half per cent of carbolic acid may be added as a preservative. The method of making mallein for diagnosis and the interpretations of the results are given in the report of the Veterinarian.

#### DISINFECTION.

##### *The Effect on Plague Bacilli of Short Exposures to Sulphur Dioxide.*

By direction of the Chairman of the Board, an experiment was made to determine whether two hours' exposure to sulphur gas can be relied on for killing plague bacilli.

*Conclusions.* — Plague bacilli, exposed on glass rods to the action of sulphur dioxide at a humidity of 83, were killed in two hours by the action of the gas (probably as  $H_2SO_3$ ) under the conditions of the experiment, which were as follows:

*Test Cultures used.* — *B. pestis bubonicæ* from four separate sources.

1st, New York (Park); 2d, San Francisco (Ryfkogel); 3d, Bombay (Wilson); 4th, China (Wilson).

Also, for comparison with these were exposed:

*B. typhoid abdominalis* from two separate sources.

1, John Hopkins Hospital (Harris); 2, Massachusetts General Hospital (Wright.)

*Staph. pyogenes aureus* 1 and 2 (Wilson).

*B. diphtheriæ* (this laboratory).

*B. mallei* ( " " ).

*Sp. cholerae Asiaticæ* (Wilson).

With the exception of *Staph. pyogenes aureus*, these were grown on plain nutrient agar at 37° C for 72 hours. The former was grown on potato under the same conditions.

*Test Objects.* — Glass rods (9 inches long,  $\frac{1}{8}$  inch diameter) were placed in stoppered test tubes, with the ends projecting from the tubes for use as handles, and sterilized. Half an hour before the experiment the rods were withdrawn from their tubes, the ends opposite the handles were rubbed over the surface of the test cultures and the rods returned to their tubes. Each rod was identified by a label on the handle, properly marked. Three rods were prepared from each culture. The solid growth thus transferred to the rods quickly dried at room temperature. Direct exposure to sunlight was avoided throughout because of its rapid action on plague bacilli. The handles of the rods were then placed in holes bored in the tops of three wooden blocks, and the blocks were placed in the test-room. Each block carried one rod from each of the test cultures. Just before igniting the sulphur the tubes were withdrawn, leaving the dried bacteria exposed on the upper ends of the rods. On the completion of the experiment, each rod was thrust, bacteria-end first, into a tube of plain nutrient agar, the bacteria rubbed off as freely as possible on the agar surface and the rod left with its lower end resting in the condensation water. These tubes were incubated at 37° C. Five days after the first inoculation, the rods were again rubbed over the agar surfaces and the condensation water was run up upon the agar also. The tubes were then incubated for twelve days more. Any bacteria remaining alive on the rods had thus every chance of development.

*Test-room.* — This was 7½ feet long, 6½ feet high and 4 feet wide, containing nearly 200 cubic feet and almost air tight. It was fitted with pressure gauges, thermometers and a hydrometer. The sulphur was burned in a pan on the

floor at one end of the room. The wooden blocks, carrying the test objects, were at the other end, one placed on the floor, the second in the middle of the wall, the third near the top of the wall. The hydrometer stood about the centre of one of the long sides of the room. The thermometers were placed, one in the middle of the ceiling, one in the middle of the test object wall and one in the upper corner of the same. These thermometers projected through the ceiling and wall to the outside so that readings could be taken from them at any moment during the experiment.

*Sulphur.* — Four hundred and ten grams of ordinary stick sulphur (a proportion of  $4\frac{1}{2}$  pounds to 1,000 cubic feet), broken small, was burned in an ordinary flared tin pan, the bottom of which was raised five to eight inches from the floor. Twenty grams of methyl alcohol were added to insure ready ignition of the sulphur. Calculations showed that abundant oxygen to support combustion is assured when the proportions here used are followed.

As soon as the alcohol was ignited the door was closed and pasted up. Temperature and pressure readings were taken at frequent intervals thereafter. (See table.) In about two hours the door was opened and the closet aired. On account of the strong sulphur fumes still present the test objects were not removed until fifteen hours later, when the odor of sulphur was very weak. No changes in air pressure were detected during the experiment. About one ounce of sulphur was found unconsumed.

*Controls.* — Since the temperature of the test-room was raised by the burning of the alcohol and sulphur (see table), it became necessary to determine to what extent the curve of temperature alone was responsible for the bactericidal effects obtained. Rods were therefore prepared from the original test cultures used in the experiment and were subjected to the same curve of temperature in a water-bath for the same length of time. They were left over night and then inoculated on agar. Other controls were made from the same original test cultures on agar and grown at  $37^{\circ}$  C.

*Summary of results of exposure to sulphur dioxide for two hours (at slightly elevated temperature).*

|                              |                                      |
|------------------------------|--------------------------------------|
| <i>B. pestis bubonicæ</i>    | 12 test objects — all killed.        |
| <i>B. typhi abdominalis</i>  | 6 test objects — all killed.         |
| <i>B. diphtheriæ</i>         | 3 test objects — all killed.         |
| <i>B. mallei</i>             | 3 test objects — all killed.         |
| <i>Sp. cholerae Asiaticæ</i> | 3 test objects — all killed.         |
| <i>St. pyogenes aureus</i>   | 6 test objects — 5 survived sulphur. |

*Results of exposure to same temperature curve in absence of sulphur dioxide.*

*B. typhi abdominalis* and *Sp. cholerae Asiaticæ* were killed. *B. pestis bubonicæ*, *B. diphtheriæ*, *B. mallei* and *St. pyogenes aureus* survived.

It is probable that the temperature of the sulphur gas affects its efficiency. Further experiments are required on this point.

*Humidity of test-room at time of lighting alcohol and sulphur = 83.*

*Gauge Readings. — No appreciable variation in pressure observed.*

#### Thermometer Readings.

| TIME ELAPSED.               | Celling. | Top of End Wall. | Middle of End Wall. |
|-----------------------------|----------|------------------|---------------------|
| Before lighting .....       | 26.5     | 26.5             | 26.5                |
| After 5 minutes .....       | 40.0     | 40.5             | 43.0                |
| 10 " .....                  | 45.0     | 44.0             | 47.0                |
| 15 " .....                  | 51.0     | 50.0             | 53.0                |
| 20 " .....                  | 52.0     | 51.5             | 53.5                |
| 25 " .....                  | 49.0     | 48.0             | 49.0                |
| 30 " .....                  | 44.0     | 43.5             | 44.0                |
| 35 " .....                  | 40.0     | 39.5             | 39.75               |
| 40 " .....                  | 37.75    | 37.25            | 37.5                |
| 50 " .....                  | 35.5     | 34.75            | 35.25               |
| 65 " .....                  | 33.75    | 33.0             | 33.5                |
| 110 " (on opening door) ... | 31.0     | 31.0             | 31.0                |

Readings of thermometers were made about every 2½ minutes until temperatures began to fall, but are only recorded for every five minutes.

#### *Examination of Charles River Clams.*

By the direction of the Board of Health, the bacteriological examination of clams (*Mya arenaria*) taken from the Charles river in the neighborhood of the Harvard bridge, was begun in August, 1900.

*Conclusions.* — These clams contain within their intestines at least three species of bacteria characteristic of sewage. These organisms were not found in the intestines of clams or oysters from less contaminated or uncontaminated waters.

*History.* — For a long time clam digging has been common on the Cambridge side of the Charles river basin, but residents of the neighborhood state that the Boston side was invaded in July, 1900, for the first time in years.

The clam flats on the Boston side lie between the river wall and the channel below Harvard bridge, near the ends of Gloucester and Hereford streets.

The Beacon Street houses which back on the river discharge their sewage directly into the water along this wall, contaminating all this area.

The clam-diggers come up the river in dories on the ebb tide, secure the clams during low tide and return on the flow, selling the clams along the harbor front, particularly at T Wharf.

*General Considerations.* — It has been definitely established that if infected with the typhoid bacillus, living shell-fish may retain the living typhoid bacilli for various periods up to ten days or more, and that once infected, raw shell-fish may convey the infection to those who eat them.

Dr. Plowright reported (Br. Med. Jour., Sept. 8, 1900) that 30 out of 70 persons constituting the population of North Lynn, England, ate clams (*Mya arenaria*) on a certain day. Fifteen of these 30 ate the clams cooked, the other 15 ate them raw. Ten of the latter group developed typhoid. The clams came from flats on the Great Ouse, 3 miles below a sewage outlet.

The general sewage of a community is capable of producing typhoid infection only when typhoid bacilli are present in the sewage, but since typhoid fever cases frequently exist or may develop at any time in such a community, sewage must always be regarded as a possible source of danger when the circumstances are such that its bacterial contents may reach the human intestine, undestroyed.

An untreated sewage, whether it contains the typhoid bacillus or not, always contains large numbers of other bacteria, some of which are believed to produce various intestinal disorders other than typhoid.

The general proposition is accepted, therefore, that food which may be eaten raw should never be exposed to untreated sewage containing the typhoid bacillus, nor to uninfected sewage unless the food is of such a character that it can be thoroughly cleansed before it is eaten.

*Examination.* — In examining the clams, attention was devoted solely to the bodies of the clams and not to the water contained in the shells.

The water around the clam in the shell is practically the same as the water surrounding the shell itself.

To prove the bacterial contamination of the water, whether lying inside or outside of the shell, was unnecessary, since it was evident on simple inspection.

The whole point in making an examination of the clams lay in determining whether the bodies of the clams—the actual substance eaten by the consumer—contained living sewage bacteria. While this might be inferred from the fact that the clams lay in grossly contaminated water, it was desired to obtain the actual demonstration also. The intestine of the clam was selected as that portion of its body most likely to show any infection which might exist.

The technique of examination was as follows:

The clam shell was opened with precautions against injury to the clam body which might infect its tissues with bacteria from the outside of the shell or the water within it.

The clam body was then washed and pinned out on a paraffin block. The upper surface of the portion containing the intestine was seared with a hot spatula, as is done in taking cultures from organs at autopsies.

With a knife, sterilized by dipping into alcohol and then igniting the alcohol at a Bunsen flame, an incision was made exposing the intestine. With a pair of forceps (similarly sterilized) the intestine, with more or less other tissue attached to it, was picked out and dropped into a sterile tube of water or broth.

Intestines from several clams were placed in each tube and the emulsions thus obtained were examined microscopically, by culture and by direct injection into guinea-pigs and rabbits.

**Results.** — From the intestines of these clams were isolated and identified —

*B. coli communis.*

*B. enteriditis sporogenes* (Klein).

*B. aerogenes capsulatus* (Welch).

These three are commonly found in sewage. A number of other bacteria, also isolated, were not further examined.

*B. coli communis.* — In the absence of the typhoid bacillus, this bacterium, since it resembles the typhoid bacillus in many respects, is considered an indicator of the probable behavior of the typhoid bacillus under parallel circumstances.

*B. enteriditis sporogenes.* — This bacterium is looked upon by Klein as one of the causes of summer diarrhoea. The

cultures isolated in this investigation were virulent in guinea-pigs. It produces spores, and is resistant to boiling for short periods (3 or 4 minutes). It is possible that it is a variety of *B. aerogenes capsulatus*.

*B. aerogenes capsulatus*. — This bacterium is not as yet known to be associated definitely with intestinal disturbances but sometimes produces other lesions by direct inoculation into the tissues.

The typhoid bacillus was not found. It was unlikely that it was present in the sewage at the time of the examination, for the sewage reaching the Charles directly at this point comes from a limited number of houses, and typhoid fever was known to exist in only one of these at the time, while the disinfection of the excreta from this case was under the charge of a trained nurse.

The search for typhoid bacilli in sewage known to contain them is, in most cases, practically hopeless, since even in severe epidemics, the number of typhoid patients contributing to the sewage is almost always small as compared with the total contributing persons. Moreover, only a small proportion of the bacteria present in a typhoid stool are typhoid bacilli.

Finally, if the sewage discharges into a large body of water, dilution of the sewage occurs and with it a further reduction of the number of typhoid bacilli per unit of cubic contents. Typhoid bacilli probably do not greatly increase in number in water and probably rarely survive more than two or three weeks. To hope to find, by examining a few cubic centimeters from a large mass of water, a bacillus present in the proportion of one individual to every ten or one hundred gallons of water is almost if not quite useless.

#### *Examination of Oysters, etc., from Marion.*

In November, 1900, four cases of typhoid fever were reported to the Board of Health with an accompanying suggestion that their origin might be traced to the eating of oysters, lying in sewage-polluted water at Marion, where the patients, residents of Boston, had been living during the summer.

Mr. Jordan, Chief Sanitary Inspector, and the writer were directed by the Board to inspect the conditions at Marion and to secure oysters for bacteriological investigation. In company with Dr. Morse, Medical Inspector of the State Board of Health, bound on a similar errand, they visited Marion, November 6, 1900. Dr. Morse supplied

many details regarding the conditions existent in Marion, discovered in his previous visits. The oysters, clams, etc., collected for examination during the trip were divided between Dr. Morse and the writer.

*Conclusion.*— So far as present evidence shows the source of infection of these Marion cases, in the writer's opinion, still remains an open question.

As too often happens, the cases had been called to the attention of the Board at a date so late that the conditions existent at the time of infection had changed.

During the investigation the following general outline was obtained by questioning several local residents.

*History.*— Marion is a small community situated on the west side of an arm of Buzzard's Bay, and during the summer accommodates a number of summer residents. Of these, about one hundred and fifty live at a hotel. The hotel and about twenty cottages, accommodating 120 to 150 persons, are ranged along the water and discharge their sewerage into it at variable distances from the shore through pipes running out under the water directly in front of the houses. The hotel sewerage system possesses an intercepting basin or cesspool for solid matters, the liquids being discharged from this basin at intervals on the half ebb tide. The discharge from the cottages is continuous. Somewhat above the hotel, a sewerage outlet from a local educational institution empties into the arm. An island, occupied by a summer resident, is situated a little below the hotel and nearly midway of the arm. The hotel sewage outlet is stated to be about 1,600 feet above this point. On the opposite side of the arm is situated a cove (Blankenships) from which many of the oysters eaten in Marion are obtained.

So far as could be learned the four cases of typhoid were infected during September. All were summer residents. No cases developed among the hotel guests.

The water, milk, vegetables and food supply (other than the oysters) were investigated by Dr. Morse without detecting any source of infection.

The hotel oysters were obtained from a distant source. The regular inhabitants and the summer cottagers obtained their oysters from Blankenships Cove as a rule. The former usually bought in small quantities and ate them at once. The latter usually bought in larger quantities and stored them for a day or two in the shallow sea water just in front of their houses, eating them by degrees. This custom had prevailed all summer.



*Summary.* — In favor of the view that the oysters were responsible, are the following points:

1. All those attacked had eaten oysters which had lain in the water exposed to sewage contamination, but no cases occurred amongst the far larger numbers who had eaten oysters from the same original source which had not lain in the same water.

2. The fact that no other source of infection could be detected.

Against the view that the oysters were responsible are the following points:

1. The incidence of the disease was atypical, — the four persons attacked were all over thirty (three males and one female), but those similarly exposed who escaped included all ages and sexes, at least one-third of them below thirty.

2. Only one (the female) of those attacked had lived at all continuously at Marion. The three males, in contrast with many of those not attacked, are stated to have gone back and forth to Boston, taking one or two meals there, nearly every day. One of them spent three weeks in Canada also.

3. These conditions had continued all summer without previous outbreaks.

4. Careful search failed to show any direct evidence that the sea water at Marion had received, previous to the development of these cases, the discharges of any typhoid patient. In the absence of such infection the sewage could not give rise to new cases.

No one of these points is decisive, for or against, because definite evidence was hard to obtain, and all the evidence obtainable presented many loopholes. Epidemics sometimes fail to follow established lines, so that the possibility of infection cannot be ruled out simply on the ground that the incidence was atypical.

*Examinations.* — The bacteriological examinations were conducted as described in the Charles river investigation (which see). For the reasons described in the report of that investigation the intestines of living oysters and clams were examined in preference to the water in the shells. Careful and repeated search failed to detect in the oysters or clams any of the organisms previously detected in the Charles river clams, the only bacterium found which is even distantly connected with sewage being a variety of *proteus*, the significance of which is but slight.

*Remarks.* — The practice of storing oysters, even for short periods, in waters, exposed to sewage contamination is to be strongly deprecated; but so also is bathing in the same

water, with the attendant danger of swallowing occasional mouthfuls. The bulk of the Marion sewage was small in comparison with the bulk of the sea water into which it poured. The rise and fall of the tides twice a day tended to minimize the dangers further by dilution and by scouring action. Thousands of persons every year probably eat oysters from much worse contaminated waters, paying the penalty doubtless in occasional cases of typhoid, but without developing epidemics of sufficient proportion to attract attention. It is true that no chances at all, however small, should be taken. Provision should be made by municipal and State authorities to prevent the development or storage of shell-fish for sale in contaminated waters, a matter which will grow in importance as sea-side population becomes denser. Either the removal of the beds or the diversion or proper treatment of the sewage should be insisted on in such cases.

*Examination of Blank Cartridges for B. tetani.*

At least seven cases of tetanus (lockjaw), six of which were fatal, occurred in Boston as the result of injuries from fireworks on or about June 17 and July 4, 1900. Blank cartridges were responsible for several of these injuries. An investigation was made to determine whether the tetanus infection in these cases was due to infection of the wads of the cartridges themselves or merely to concomitant circumstances.

*Conclusions.*—The blank cartridge itself may be considered usually innocent from the bacteriological standpoint. The infection seems to be due to the serious nature of the wound inflicted, and the circumstances under which it is usually inflicted.

Tetanus is due to the presence and activity of the poisons produced by the tetanus bacillus, an organism which is found in the soil, varying in abundance in different places. This bacillus grows best in the absence of air. A punctured wound, or a deep ragged wound, therefore, furnish favorable conditions for it. Such wounds, if soil, dirt, etc., containing the tetanus bacillus reaches them, are likely to result in tetanus unless the body forces succeed in neutralizing the poisons they produce or the bacilli happen to be non-virulent. Clean-cut open wounds are less likely to result in tetanus, because they are more readily washed out, and the air is not so readily excluded from them.

A clean weapon of any kind, cutting or breaking a clean skin is unlikely to infect the wound with tetanus bacilli,

but if soil, etc., reaches the wound afterwards, the disease may develop. Any weapon already dirty with soil, or a clean weapon cutting through a soil-dirtied skin may carry the infection directly into the wound.

Blank cartridge wounds seem to be particularly favorable to the tetanus bacillus. Owing to the cheap and dangerous construction of the ordinary toy pistol accidental wounds are not uncommon, especially amongst the younger boys. In such cases the cartridges are usually discharged at close ranges, and the pasteboard wad is driven through the skin with an explosive force which makes a ragged wound, lacerating the tissues deeply in different directions.

The wound is often in the hand. Here particularly tough faciae overlying softer parts conduce to the extension under the faciae of ramifications of the main wound and prevent ready exploration and disinfection of these.

The hands of those engaged in fireworks celebrations are likely to be more or less begrimed with soil, dust, etc., and this dirt is likely to be carried into the wound.

While these features partly suffice to explain the greater frequency of tetanus from blank cartridge wounds than from those inflicted by other forms of fireworks, it was considered well to try whether the blank cartridges themselves might not be infected.

A similar investigation was carried out by H. G. Wells, and yielded negative results, in which cartridges obtained from different parts of the country were examined. In the tests made here a larger number of cartridges, of local makes, were tried.

The methods consisted in (1st) separating the wads, powder and shells of 350 cartridges of different calibres; (2d) injecting these directly or extracts and anaerobic cultures made from them into guinea-pigs and rabbits; (3d) microscopic examination of the cultures, extracts, etc.

Nothing resembling the tetanus bacillus was seen, nor did any of the animals exhibit signs of tetanus.

#### *Arsenic in Calcimine.*

In December, 1900, complaint was made to the Board of Health that Paris green (arsenite of copper) had been used in tinting the walls of certain of the class-rooms and dressing-rooms of the Polk-street School, Charlestown. By the direction of the Board this subject was investigated.

It was found that, two or three months earlier, the walls complained of had been tinted green. These walls, when

rubbed with the finger, yielded a light green powder. On brushing down the wall with a clean piece of paper sufficient dust for a test was obtained. Dust was also collected from the floors. Both of these samples yielded arsenic. A paper box labelled "*Poison*," "*Paris green*," said to be an original container of the material used for the tint, was secured and the green dust remaining in it yielded arsenic also. Action was taken by the Board.

In January, 1901, a somewhat similar complaint was made regarding the blackboards of four other schools. On investigation a greenish tint was readily apparent on the boards complained of, but tests for arsenic were negative in all cases. The green chalk used was examined also with similar results.

An appendix follows, containing tables illustrating the routine work.

All of which is respectfully submitted.

HIBBERT WINSLOW HILL, M.D.,

*Director.*

## APPENDIX TO LABORATORY REPORT.

TABLE SUMMARIZING ROUTINE EXAMINATIONS FOR YEAR  
ENDING JANUARY 31, 1901.

|                             | Diphtheria. | Tuberculosis. | Typhoid. | Glanders. | Malaria. <sup>1</sup> | Other diseases. <sup>2</sup> | Total. | Av. per day. |
|-----------------------------|-------------|---------------|----------|-----------|-----------------------|------------------------------|--------|--------------|
| February, 1900.....         | 1,247       | .....         | 19       | 12        | 1                     | 2                            |        |              |
| March .....                 | 1,231       | .....         | 40       | 6         | .....                 | 1                            |        |              |
| April .....                 | 848         | 6             | 43       | 9         | 3                     | 4                            |        |              |
| May.....                    | 1,098       | 100           | 58       | 8         | 6                     | 12                           |        |              |
| June.....                   | 993         | 130           | 93       | 8         | 1                     | .....                        |        |              |
| July.....                   | 600         | 85            | 71       | 6         | 4                     | 1                            |        |              |
| August.....                 | 555         | 82            | 102      | 10        | 5                     | 1                            |        |              |
| September.....              | 864         | 93            | 161      | 15        | .....                 | 4                            |        |              |
| October.....                | 1,777       | 106           | 139      | 10        | 6                     | 6                            |        |              |
| November .....              | 2,363       | 105           | 102      | 20        | 7                     | 1                            |        |              |
| December.....               | 3,902       | 128           | 97       | 11        | 3                     | 6                            |        |              |
| January, 1901.....          | 2,980       | 186           | 89       | 4         | 2                     | 6                            |        |              |
| Parental School, special... | 431         |               |          |           |                       |                              |        |              |
| 1900-01.....                | 18,889      | 1,021         | 1,014    | 119       | 38                    | 44                           | 21,121 | 57           |
| 1899-00.....                | 7,930       | not done.     | 483      | 65        | 19                    | 29                           | 8,876  | 24           |

<sup>1</sup> Only one of these examinations yielded positive results.<sup>2</sup> Including gonorrhoea, actinomycosis, cerebro-spinal meningitis, etc.

**Table No. I. — Diphtheria.**  
SHOWING CULTURES CLASSIFIED.

| February to October.               | Positive. | Negative. | No Growth. | Total. |
|------------------------------------|-----------|-----------|------------|--------|
| Primary.....                       | 1,418     | 3,532     | 35         |        |
| Secondary.....                     | 1,477     | 2,715     | 36         |        |
| Total.....                         | 2,895     | 6,247     | 71         |        |
| November, December and January.... | 3,222     | 5,993     | 30         |        |
|                                    | 6,117     | 12,240    | 101        | 18,458 |
| Parental School, special .....     |           |           |            | 431    |
| Grand total.....                   |           |           |            | 18,889 |

The classification above given is incomplete for November, December and January, on account of lack of time to properly tabulate the work of these three months.

**Table No. II. — Diphtheria.**  
SHOWING CASES CLASSIFIED.

|                                | POSITIVE.      |              | NEGATIVE.      |              | NO GROWTH. | TOTAL.         |              | TOTAL.    |           |            | Grand Total. |
|--------------------------------|----------------|--------------|----------------|--------------|------------|----------------|--------------|-----------|-----------|------------|--------------|
|                                | For Diagnosis. | For Release. | For Diagnosis. | For Release. |            | For Diagnosis. | For Release. | Positive. | Negative. | No Growth. |              |
| February .....                 | 179            | 30           | 415            | 37           | 4          | 598            | 67           | 209       | 452       | 4          | 665          |
| March .....                    | 138            | 35           | 434            | 54           | 3          | 575            | 89           | 173       | 468       | 3          | 664          |
| April .....                    | 109            | 11           | 355            | 20           | 2          | 466            | 31           | 120       | 375       | 2          | 497          |
| May .....                      | 165            | 21           | 324            | 24           | 1          | 490            | 45           | 186       | 348       | 1          | 535          |
| June .....                     | 131            | 20           | 342            | 29           | 3          | 476            | 49           | 151       | 371       | 3          | 525          |
| July .....                     | 67             | 13           | 215            | 18           | 1          | 283            | 31           | 80        | 233       | 1          | 314          |
| Total for first six months...  | 789            | 130          | 2,085          | 182          | 14         | 2,885          | 312          | 919       | 2,267     | 14         | 3,200        |
| Total for second six months... | 1,480          | .....        | 3,515          | .....        | .....      | 4,995          | .....        | .....     | .....     | .....      | .....        |
|                                | 2,269          | .....        | 5,600          | .....        | .....      | 7,869          | .....        | .....     | .....     | .....      | 18,600       |

<sup>1</sup> Estimated.

The persons positive "for diagnosis" yielded at least one positive culture early in the course of the attack. Those negative "for diagnosis" yielded *only* negative cultures at any time.

Those positive "for release" include all those examined for release alone which yielded one or more positive cultures. Those negative "for release" were examined only for release and yielded no positive cultures at any time. Six cases (up to July) negative "for diagnosis" but positive "for release," have been included with the positives for release.

The cases from August, 1900, to January, 1901, inclusive, were not classified completely for lack of time.

Table No. III.—Diphtheria.

SHOWING THE CULTURES ON ALL THE POSITIVE CASES FOR DIAGNOSIS, INCLUDING THOSE ON WHICH THE EARLIER EXAMINATIONS WERE NOT POSITIVE; ALSO SHOWING APPROXIMATE DEGREE OF UNRELIABILITY OF ONE NEGATIVE CULTURE FOR DIAGNOSIS.

|               | 1                       | 2                          | 3                                          | 4                                             | 5                       | 6                                     | 7                                   | 8                                                | 9                      | 10                                    | 11                            | 12           | 13                 |
|---------------|-------------------------|----------------------------|--------------------------------------------|-----------------------------------------------|-------------------------|---------------------------------------|-------------------------------------|--------------------------------------------------|------------------------|---------------------------------------|-------------------------------|--------------|--------------------|
|               | Total Positive Persons. | Positive on First Culture. | Negative on First Culture, Positive later. | Per cent. of Cases Positive on First Culture. | Total Negative Persons. | Total showing two! or more Negatives. | Total Persons two or more Cultures. | First Culture Negative, Second Culture Positive. | All Cultures Negative. | Per cent. Positive on Second Culture. | Requests for another Culture. | No Response. | Response Positive. |
| February..... | 179                     | 165                        | 14                                         | 92%                                           | 415                     | 32                                    | 46                                  | 14                                               | 32                     | 36%                                   | 51                            | 32           | 9                  |
| March.....    | 138                     | 128                        | 10                                         | 93%                                           | 434                     | 37                                    | 47                                  | 10                                               | 37                     | 21%                                   | 34                            | 24           | 6                  |
| April.....    | 109                     | 105                        | 4                                          | 96%                                           | 355                     | 37                                    | 41                                  | 4                                                | 37                     | 10%                                   | 20                            | 16           | 0                  |
| May.....      | 165                     | 161                        | 4                                          | 97%                                           | 324                     | 26                                    | 30                                  | 4                                                | 26                     | 13%                                   | 18                            | 5            | 3                  |
| June.....     | 131                     | 124                        | 7                                          | 95%                                           | 342                     | 19                                    | 26                                  | 7                                                | 19                     | 27%                                   | 75                            | 60           | 7                  |
| July.....     | 67                      | 60                         | 7                                          | 90%                                           | 215                     | 12                                    | 19                                  | 7                                                | 12                     | 37%                                   | 45                            | 38           | 4                  |
| Total.....    | 789                     | 743                        | 46                                         | 94%                                           | 2,085                   | 163                                   | 209                                 | 46                                               | 163                    | 22%                                   | 243                           | 175          | 29                 |

Column 4 (based on columns 1, 2, and 3) shows, apparently, that if 100 persons carrying *B. diphtheria* be examined by one culture only, the bacilli will probably fail of detection in six. This figure is too low because of the fact (shown in columns 6 and 7) that but one culture, and that one negative, was sent in from each of a large number of persons (column 5), some of whom doubtless would have yielded the bacilli on a subsequent examination, had such been made.

Column 10 (based on columns 7, 8, and 9) shows apparently that if 100 suspected persons yield negative cultures on a single examination, twenty-two of them nevertheless carry the bacilli. This figure is too high for general application because the mere fact that a second culture was sent in shows that all the persons thus examined twice were strongly suspected of the disease, and amongst such the proportion of bacillus-carrying persons is naturally higher than amongst the ordinary run of persons examined for diagnosis composed partly (50 per cent.) of cases believed not to be diphtheria, partly (30 per cent.) of cases on whom the diagnosis is doubtful and only partly (20 per cent.) of strongly suspected cases. The real error lies somewhere between these extremes.

Table No. IV. — Diphtheria.

SHOWING COMPARISON BETWEEN CLINICAL DIAGNOSIS AND BACTERIOLOGICAL DIAGNOSIS.

|                | CLINICAL<br>DIAGNOSIS<br>POSITIVE,<br>BACTERIO-<br>LOGICAL<br>RESULT — |      |       | CLINICAL<br>DIAGNOSIS<br>NEGATIVE,<br>BACTERIO-<br>LOGICAL<br>RESULT — |      |       | CLINICAL<br>DIAGNOSIS<br>DOUBTFUL,<br>BACTERIO-<br>LOGICAL<br>RESULT — |      |       | CLINICAL<br>DIAGNOSIS<br>NOT GIVEN,<br>BACTERIO-<br>LOGICAL<br>RESULT — |      |       | PER CENT.<br>OF CLINICAL<br>DIAGNOSES<br>CONFIRMED. |         |
|----------------|------------------------------------------------------------------------|------|-------|------------------------------------------------------------------------|------|-------|------------------------------------------------------------------------|------|-------|-------------------------------------------------------------------------|------|-------|-----------------------------------------------------|---------|
|                | 1                                                                      | 2    | 3     | 4                                                                      | 5    | 6     | 7                                                                      | 8    | 9     | 10                                                                      | 11   | 12    | 13                                                  | 14      |
|                | POS.                                                                   | NEG. | N. G. | POS.                                                                   | NEG. | N. G. | POS.                                                                   | NEG. | N. G. | POS.                                                                    | NEG. | N. G. | C. D. +                                             | C. D. - |
| February ..... | 75                                                                     | 22   | 0     | 23                                                                     | 194  | 4     | 38                                                                     | 63   | 0     | 73                                                                      | 136  | 0     | 77%                                                 | 90%     |
| March .....    | 35                                                                     | 19   | 0     | 20                                                                     | 169  | 0     | 26                                                                     | 88   | 0     | 57                                                                      | 158  | 3     | 66%                                                 | 89%     |
| April .....    | 32                                                                     | 21   | 0     | 15                                                                     | 160  | 0     | 30                                                                     | 76   | 1     | 32                                                                      | 96   | 1     | 60%                                                 | 91%     |
| May .....      | 58                                                                     | 24   | 0     | 20                                                                     | 141  | 1     | 27                                                                     | 56   | 0     | 60                                                                      | 105  | 0     | 71%                                                 | 87%     |
| June .....     | 60                                                                     | 26   | 0     | 16                                                                     | 99   | 0     | 15                                                                     | 68   | 1     | 40                                                                      | 109  | 3     | 70%                                                 | 86%     |
| July .....     | 32                                                                     | 21   | 0     | 6                                                                      | 78   | 1     | 12                                                                     | 55   | 0     | 17                                                                      | 61   | 0     | 60%                                                 | 93%     |
|                | 292                                                                    | 133  | 0     | 100                                                                    | 841  | 6     | 148                                                                    | 406  | 2     | 279                                                                     | 667  | 6     | 68%                                                 | 89%     |

Column 13 (based on columns 1 and 2) shows that when a physician makes definitely a positive clinical diagnosis at the time of taking the culture, bacilli are found in 68 per cent. of the cases.

Column 14 (based on columns 4 and 5) shows that when the physician makes definitely a negative clinical diagnosis at the time of taking the culture, bacilli are found in 11 per cent. of the cases.

Two sources of error in comparing the clinical and bacteriological examinations must be noted: One, that the physician's early diagnosis may change later on, indeed even before the result of the culture is reported; the other, that the cultural report, especially when negative, does not indicate correctly in all cases the presence or absence of the disease of diphtheria, although the positive reports are reliable as showing the presence of the bacilli of diphtheria. The percentage of bacillus-carrying persons reported negative from the laboratory is probably small; so also the percentage of persons suspected more or less strongly of diphtheria and found positive at the laboratory, yet not suffering from the disease, is also small. It is impossible, however, to give the exact figures.

Table No. V. — Diphtheria.

SHOWING CASES EXPOSED TO DIPHTHERIA, BUT WITHOUT ANY SYMPTOMS.

|                | Total<br>Persons<br>Exposed. | Positive. | Negative. |
|----------------|------------------------------|-----------|-----------|
| February ..... | 5                            | 2         | 3         |
| March .....    | 9                            | .....     | 9         |
| April .....    | 6                            | 1         | 5         |
| May .....      | 3                            | .....     | 3         |
| June .....     | 5                            | 1         | 4         |
| July .....     | 2                            | .....     | 2         |
|                | 30                           | 4         | 26        |

NOTE.—These 30 persons were examined because of exposure to clinical diphtheria, a small percentage only showing the bacilli.



**Table No. VI. — Diphtheria.**

SHOWING NEGATIVE CULTURES OBTAINED FOR RELEASE, INCLUDING PREMATURE NEGATIVES. ALL WERE RELEASED FINALLY BY TWO CONSECUTIVE NEGATIVES.

|                | 1                                         | 2                                           | 3                                                        |
|----------------|-------------------------------------------|---------------------------------------------|----------------------------------------------------------|
|                | Positive cases released on two negatives. | Positive cases showing premature negatives. | Per cent. of positive cases showing premature negatives. |
| February ..... | 113                                       | 34                                          | 30%                                                      |
| March .....    | 76                                        | 20                                          | 26%                                                      |
| April .....    | 63                                        | 19                                          | 30%                                                      |
| May .....      | 91                                        | 41                                          | 45%                                                      |
| June .....     | 71                                        | 23                                          | 30%                                                      |
| July .....     | 41                                        | 17                                          | 41%                                                      |
|                | 455                                       | 154                                         | 34%                                                      |

Column 1 shows total positive cases which were released by two consecutive negatives (46 such cases were released otherwise, making a total released of 501).

Column 2 shows the number of these which, during the taking of cultures for release, yielded one negative culture and subsequently a positive culture. Such a negative culture for release is called a premature negative.

Column 3 shows that if release were granted on one negative culture only, 34% of the total positive cases released by the laboratory would still carry the bacilli after such release.

**Table No. VII. — Diphtheria.**

SHOWING TERMINATION OF CASES EXAMINED BY THE LABORATORY.

|                | 1                                  | 2                                    | 3                          | 4                                             | 5                                             | 6                          | 7                        | 8                        | 9               |
|----------------|------------------------------------|--------------------------------------|----------------------------|-----------------------------------------------|-----------------------------------------------|----------------------------|--------------------------|--------------------------|-----------------|
|                | Cases positive for diagnosis only. | Positive for diagnosis and released. | Positive for release only. | Negative for diagnosis, positive for release. | Negative for diagnosis, negative for release. | Negative for release only. | Total positive released. | Total negative released. | Total released. |
| February ..... | 85                                 | 94                                   | 30                         | .....                                         | .....                                         | 37                         | 124                      | 37                       | 161             |
| March .....    | 85                                 | 53                                   | 35                         | 3                                             | 6                                             | 54                         | 91                       | 60                       | 151             |
| April .....    | 50                                 | 59                                   | 11                         | .....                                         | 8                                             | 20                         | 70                       | 23                       | 98              |
| May .....      | 89                                 | 76                                   | 21                         | 2                                             | .....                                         | 24                         | 99                       | 24                       | 123             |
| June .....     | 76                                 | 55                                   | 20                         | 1                                             | .....                                         | 29                         | 76                       | 29                       | 105             |
| July .....     | 39                                 | 28                                   | 13                         | .....                                         | 2                                             | 18                         | 41                       | 20                       | 61              |
|                | 424                                | 365                                  | 130                        | 6                                             | 16                                            | 182                        | 501                      | 198                      | 699             |

Column 1 shows persons examined for diagnosis, and yielding one or more positive cultures, but not subsequently examined by the laboratory for release. These cases examined for diagnosis died or were removed to the hospital.

Column 2 shows persons examined at the laboratory for diagnosis and also, subsequently, for release.

Columns 3 and 6 represent cases reported as diphtheria without a culture for diagnosis but examined eventually for release. Column 3 shows the cases of this group which yielded positive cultures; column 6 the cases which yielded only negative cultures.

Columns 4 and 5 correspond with columns 3 and 6 respectively, except that cultures were sent in for diagnosis as well but proved negative, despite which they were reported as diphtheria on clinical evidence.

**Table No. VIII.—Diphtheria.**

COMPARATIVE RESULTS FROM SWAB, FIVE-HOUR AND FIFTEEN-HOUR EXAMINATIONS.

## A.

*Swab Examinations and Five-hour Incubations.*

|               | SWABS POSITIVE.     |                     |                     | SWABS NEGATIVE.     |                     |                     | SWABS DOUBTFUL.     |                     |                     | PERCENT. WHICH POSITIVE SWABS WERE. |
|---------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-------------------------------------|
|               | Five-hour Positive. | Five-hour Negative. | Five-hour Doubtful. | Five-hour Positive. | Five-hour Negative. | Five-hour Doubtful. | Five-hour Positive. | Five-hour Negative. | Five-hour Doubtful. | Of Positive five hours.             |
| February..... | 12                  | .....               | .....               | .....               | 3                   | .....               | .....               | .....               | 1                   | 100%                                |
| March.....    | 6                   | 1                   | 1                   | 4                   | 31                  | 2                   | .....               | 1                   | 2                   | 80%                                 |
| April.....    | 3                   | .....               | .....               | 3                   | 17                  | 4                   | 2                   | .....               | .....               | 87%                                 |
| May.....      | 1                   | .....               | .....               | 3                   | 24                  | .....               | .....               | 1                   | .....               | 20%                                 |
| June.....     | 6                   | 1                   | .....               | 3                   | 25                  | 1                   | 3                   | 3                   | .....               | 56%                                 |
| July.....     | .....               | .....               | 4                   | 4                   | 17                  | 4                   | 1                   | 1                   | 2                   | 44%                                 |
| Total.....    | 27                  | 2                   | 5                   | 17                  | 117                 | 11                  | 7                   | 6                   | 5                   | 67%                                 |

This table shows that diphtheria bacilli may be detected in 67% of the swabs used to inoculate cultures, when the cultures from them prove positive after five hours' growth. Two cases in which the five-hour growth was negative have been included, since the positive result from the swab shows these negatives to have been in error.

## B.

*Swab Examinations and Fifteen-hour Incubations.*

|               | SWABS POSITIVE.        |                        |                        | SWABS NEGATIVE.        |                        |                        | SWABS DOUBTFUL.        |                        |                        | PERCENT. WHICH POSITIVE SWABS WERE. |
|---------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------------------|
|               | Fifteen-hour Positive. | Fifteen-hour Negative. | Fifteen-hour Doubtful. | Fifteen-hour Positive. | Fifteen-hour Negative. | Fifteen-hour Doubtful. | Fifteen-hour Positive. | Fifteen-hour Negative. | Fifteen-hour Doubtful. | Of Positive fifteen hours.          |
| February..... | 21                     | 2                      | .....                  | 6                      | 4                      | .....                  | 7                      | 1                      | .....                  | 67%                                 |
| March.....    | 8                      | 6                      | .....                  | 13                     | 55                     | .....                  | 4                      | 3                      | .....                  | 52%                                 |
| April.....    | 5                      | .....                  | .....                  | 9                      | 25                     | 2                      | 4                      | .....                  | .....                  | 28%                                 |
| May.....      | 12                     | 1                      | .....                  | 9                      | 33                     | .....                  | 1                      | 1                      | .....                  | 60%                                 |
| June.....     | 6                      | .....                  | .....                  | 11                     | 30                     | .....                  | 7                      | .....                  | .....                  | 26%                                 |
| July.....     | 9                      | 3                      | .....                  | 4                      | 29                     | 1                      | 3                      | 5                      | .....                  | 76%                                 |
| Total.....    | 62                     | 12                     | .....                  | 52                     | 176                    | 3                      | 26                     | 10                     | .....                  | 52%                                 |

This table shows that diphtheria bacilli may be detected in about 52% of the swabs used to inoculate cultures, when the cultures from them prove positive after fifteen hours' growth. Twelve cases in which the fifteen-hour growth was negative have been included, since the positive result on the swab showed these negatives to have been in error.

## C.

*Five-Hour and Fifteen-Hour Incubation.*

|                | FIVE-HOUR<br>POSITIVE. |                      |                      | FIVE-HOUR<br>NEGATIVE. |                      |                      | FIVE-HOUR<br>DOUBTFUL. |                      |                      | PER CENT.<br>WHICH POS.<br>FIVE HOURS<br>ARE OF POS. |
|----------------|------------------------|----------------------|----------------------|------------------------|----------------------|----------------------|------------------------|----------------------|----------------------|------------------------------------------------------|
|                | 15-hour<br>positive.   | 15-hour<br>negative. | 15-hour<br>doubtful. | 15-hour<br>positive.   | 15-hour<br>negative. | 15-hour<br>doubtful. | 15-hour<br>positive.   | 15-hour<br>negative. | 15-hour<br>doubtful. | 15 hours.                                            |
| February ..... | 12                     | .....                | .....                | 2                      | 1                    | .....                | 1                      | .....                | .....                | 60%                                                  |
| March.....     | 7                      | 3                    | .....                | 6                      | 42                   | .....                | .....                  | 5                    | .....                | 77%                                                  |
| April.....     | 8                      | .....                | .....                | 2                      | 16                   | 1                    | 2                      | 3                    | .....                | 75%                                                  |
| May.....       | 7                      | .....                | .....                | 4                      | 25                   | .....                | .....                  | 3                    | .....                | 63%                                                  |
| June.....      | 10                     | 1                    | .....                | 3                      | 27                   | .....                | 1                      | .....                | .....                | 70%                                                  |
| July.....      | 4                      | .....                | 1                    | 1                      | 19                   | .....                | 4                      | 7                    | .....                | 53%                                                  |
|                | 48                     | 4                    | 1                    | 18                     | 130                  | 1                    | 8                      | 18                   | .....                | 71%                                                  |

This table shows that diphtheria bacilli may be detected in about 71% of cultures after five hours' incubation, when the cultures from them prove positive after fifteen hours' incubation. Four cases in which the fifteen-hour growth was negative are included, because the positive results from the five-hour incubation showed these negatives to have been in error.

**Table No. IX. — Diphtheria.***Showing Relation of Bacteriological Findings to Lesions.*

| February, March, April.    | Membrane. | Exudate. | Inflammation. | Doubtful. | Absent. | Not given. | Total. | Per cent. with mem-<br>brane. | Per cent. with exu-<br>date. | Per cent. with inflam-<br>mation. | Per cent. with no<br>lesion. |           |
|----------------------------|-----------|----------|---------------|-----------|---------|------------|--------|-------------------------------|------------------------------|-----------------------------------|------------------------------|-----------|
| Bacteriological result +.. | 332       | 4        | 40            | 1         | 25      | 24         | 426    | 83%                           | 1%                           | 10%                               | 6%                           | Doubtful. |
| Bacteriological result —.. | 636       | 33       | 312           | 25        | 82      | 116        | 1,204  | 58%                           | 3%                           | 30%                               | 7%                           | 2%        |

Very little stress can be laid on the distinction between membrane and exudate in this table. Moreover, even if correctly stated, the presence or absence of lesion given applies only to the time at which the culture was taken for diagnosis. The table serves to show, however, that 84% of the positive cultures showed what appeared to be membrane or exudate; 10% more showed inflammation, and in only 6% was absence of lesion recorded. These percentages are calculated without reference to those cases on which no record of lesions was made.

**Table No. X. — Diphtheria.***Showing Length in Days of Bacteriological Stages of Diphtheria.*

| EARLIEST SYMPTOMS<br>TO<br>1ST POS. |              |           | 1ST POS.<br>TO<br>LAST POS. |              |           | LAST POS.<br>TO<br>1ST NEG. |              |           | 1ST NEG.<br>TO<br>2D NEG. |              |           | 1ST PREM.<br>NEG. FOR<br>RELEASE<br>TO 2D NEG. |              |           | EARLIEST SYMPTOMS<br>TO<br>2D NEG. |                                  |  |
|-------------------------------------|--------------|-----------|-----------------------------|--------------|-----------|-----------------------------|--------------|-----------|---------------------------|--------------|-----------|------------------------------------------------|--------------|-----------|------------------------------------|----------------------------------|--|
| No. of cases.                       | Av. in days. | Extremes. | No. of cases.               | Av. in days. | Extremes. | No. of cases.               | Av. in days. | Extremes. | No. of cases.             | Av. in days. | Extremes. | No. of cases.                                  | Av. in days. | Extremes. |                                    |                                  |  |
| 296                                 | 2.4          | 0-32      | 116                         | 15.6         | 2-41      | 136                         | 5.8          | 1-20      | 196                       | 2.8          | 1-39      | 71                                             | 6.3          | 1-24      | 26.6                               | Feb., Mar., Apr.                 |  |
|                                     |              |           |                             |              |           |                             |              |           |                           |              |           | 77                                             | 11.3         | 2-36      | 20.0                               | { 138 cases.<br>May, June, July. |  |

This table is incomplete, because, in many cases, the date of earliest symptoms was not recorded; such cases were not included above. Moreover, the length of the stages given are those obtaining in actual practice here, not those *necessarily* existing. Thus the bacilli are present and detectable before the earliest symptoms develop, but they are not usually detected bacteriologically by us until the second or third day, simply because the physician is usually called in not earlier than this time.

The length of the intervals recorded between the first positive and last positive, between the last positive and first negative, and between the first and second negative depends somewhat upon the frequency with which cultures are taken, especially in the latter two stages.

**Table No. Ia. — Tuberculosis.**

MONTHLY TOTALS OF EXAMINATIONS.

| MONTH.         | Total. | Positive. | Negative. |
|----------------|--------|-----------|-----------|
| April .....    | 6      | 2         | 4         |
| May .....      | 100    | 37        | 63        |
| June.....      | 130    | 52        | 78        |
| July.....      | 85     | 36        | 49        |
| August.....    | 82     | 34        | 48        |
| September..... | 93     | 39        | 54        |
| October.....   | 106    | 47        | 59        |
| November.....  | 105    | 43        | 62        |
| December ..... | 128    | 35        | 93        |
| January .....  | 186    | 66        | 120       |

**Table No. Ib.—Tuberculosis.**

SHOWING RESULTS OF EXAMINATIONS OF SPECIMENS CLASSIFIED.

| NATURE OF SPECIMEN.   | Primary Positive. | Primary Negative. | Secondary Positive. | Secondary Negative. | Total Positive. | Total Negative. | Total Examinations. |
|-----------------------|-------------------|-------------------|---------------------|---------------------|-----------------|-----------------|---------------------|
| Sputum.....           | 367               | 527               | 23                  | 93                  | 390             | 620             |                     |
| Urine.....            | 1                 | 4                 | .....               | 1                   | 1               | 5               |                     |
| Pus.....              | .....             | 3                 | .....               | .....               | .....           | 3               |                     |
| Rectal discharge..... | .....             | 1                 | .....               | 1                   | .....           | 2               |                     |
| Total .....           | 368               | 535               | 23                  | 95                  | 391             | 630             | 1,021               |
|                       |                   |                   |                     |                     | 38.3%           | 61.7%           | 100%                |

**Table No. II.—Tuberculosis.**

SHOWING CASES CLASSIFIED.

| NATURE OF SPECIMEN.   | Positive. | Negative. | Total. |
|-----------------------|-----------|-----------|--------|
| Sputum.....           | 377       | 518       | 895    |
| Urine.....            | 1         | 4         | 5      |
| Pus.....              | .....     | 3         | 3      |
| Rectal discharge..... | .....     | 1         | 1      |
| Total .....           | 378       | 526       | 904    |
|                       | 41.8%     | 58.2%     | 100%   |

Of the 377 positive sputum cases, 369 proved positive on the first examination; the remaining 8 yielded a negative result on the first examination, a positive result subsequently.

Two cases positive in the first examination yielded three subsequent negative results each. One of these still later yielded two positive results.

This corresponds with a failure to find the bacilli on the first examination in only a trifle over 2 per cent. of the cases where they were finally shown to be present. The true percentage of failure is probably larger than this, because a second examination after one negative result was made in only a small proportion of such cases.

**Table No. III.—Tuberculosis.**

SHOWING COMPARISON BETWEEN CLINICAL DIAGNOSIS AND BACTERIOLOGICAL DIAGNOSIS.

| Clinical Diagnosis. | BACTERIOLOGICAL DIAGNOSIS. |           |           |
|---------------------|----------------------------|-----------|-----------|
|                     | Total.                     | Positive. | Negative. |
| Positive .....      | 322                        | 200       | 122       |
| Negative .....      | 138                        | 28        | 110       |
| Doubtful .....      | 233                        | 80        | 153       |
| Not given .....     | 202                        | 69        | 133       |
| Total .....         | 895                        | 377       | 518       |

The same in Percentages.

| Clinical Diagnosis. | BACTERIOLOGICAL DIAGNOSIS. |           |           |
|---------------------|----------------------------|-----------|-----------|
|                     | Total.                     | Positive. | Negative. |
| Positive .....      | 100%                       | 62.1      | 37.9      |
| Negative .....      | 100%                       | 20.3      | 79.7      |
| Doubtful .....      | 100%                       | 34.3      | 65.7      |
| Not given .....     | 100%                       | 34.4      | 65.6      |

Actual concordance 67.4%  
 Theoretical concordance 70.9%

The clinical diagnosis in tuberculosis, as recorded at the time of collecting the specimen is less liable to change, on purely clinical grounds, than the clinical diagnosis made in diphtheria under similar circumstances (see Table No. IV.—Diphtheria). The negative bacteriological result in sputum examinations is probably nearly as unreliable as in diphtheria examinations.

**Table No. IV.—Tuberculosis.**

SHOWING SEX OF POSITIVE SPUTUM CASES.

| Male.                                     | Female. | Not Given. | Total. |
|-------------------------------------------|---------|------------|--------|
| 227                                       | 143     | 7          | 377    |
| Percentage, omitting "not given." } 61.4% | 38.6%   | .....      | .....  |

**Table No. V.—Tuberculosis.**

SHOWING COLOR OF POSITIVE CASES.

| White. | Black. | Yellow. | Not Given. | Total. |
|--------|--------|---------|------------|--------|
| 326    | 5      | 2       | 44         | 377    |

**Table No. VI. — Tuberculosis.**

SHOWING AGES OF POSITIVE CASES.

| Ages.        | Number. | Ages.          | Number. |
|--------------|---------|----------------|---------|
| 10 - 15..... | 5       | 50 - 55.....   | 12      |
| 15 - 20..... | 30      | 55 - 60.....   | 4       |
| 20 - 25..... | 67      | 60 - 65.....   | 4       |
| 25 - 30..... | 57      | 65 - 70.....   | 1       |
| 30 - 35..... | 63      | 70 - 80.....   | 1       |
| 35 - 40..... | 47      | Above 80.....  | 1       |
| 40 - 45..... | 30      | Not given..... | 41      |
| 45 - 50..... | 14      | Total.....     | 377     |

**Table No. VII. — Tuberculosis.**

SHOWING OCCUPATIONS OF POSITIVE SPUTUM CASES.

| Occupations.                                                    | Number. | Occupations.                                                               | Number. |
|-----------------------------------------------------------------|---------|----------------------------------------------------------------------------|---------|
| Agents.....                                                     | 3       | Nurses.....                                                                | 2       |
| Bakers.....                                                     | 6       | Office work (includes clerks,<br>bookkeepers, stenographers,<br>etc.)..... | 38      |
| Barbers.....                                                    | 4       | Optician.....                                                              | 1       |
| Convicts.....                                                   | 3       | Pedler.....                                                                | 1       |
| Factory hands.....                                              | 5       | Railroad employes.....                                                     | 8       |
| Fireman.....                                                    | 1       | Reporter.....                                                              | 1       |
| Florist.....                                                    | 1       | Sailors.....                                                               | 2       |
| Housekeepers.....                                               | 79      | Sales people.....                                                          | 10      |
| Hotel and restaurant employes,                                  | 8       | School children.....                                                       | 11      |
| Junk dealer.....                                                | 1       | Servants.....                                                              | 8       |
| Laborers.....                                                   | 25      | Skilled help.....                                                          | 55      |
| Laundryman (Chinese).....                                       | 1       | Soldier.....                                                               | 1       |
| Lawyers.....                                                    | 1       | Tailoring (dressmakers, seam-<br>stresses, etc.).....                      | 6       |
| Liquor business.....                                            | 5       | Teachers.....                                                              | 4       |
| Mall clerks.....                                                | 2       | Teamsters.....                                                             | 10      |
| Merchants, etc.....                                             | 5       | Undertaker.....                                                            | 1       |
| Millinery.....                                                  | 1       |                                                                            |         |
| Minors employed.....                                            | 6       |                                                                            |         |
| Miscellaneous (employment not<br>given, no employment, etc.) .. | 60      | Total.....                                                                 | 377     |
| Musician.....                                                   | 1       |                                                                            |         |

Under "Housekeeper" are included cases designated as wives, houseworker, etc.

**Table No. I. — Typhoid.**

MONTHLY TOTALS OF WIDAL REACTIONS.

|               | Pos. | Neg. | Atyp. | Total. |              | Pos. | Neg. | Atyp. | Total. |
|---------------|------|------|-------|--------|--------------|------|------|-------|--------|
| 1900.         |      |      |       |        | 1900.        |      |      |       |        |
| February .... | 4    | 14   | 1     | 19     | August ..... | 7    | 50   | 45    | 102    |
| March .....   | 7    | 29   | 4     | 40     | September..  | 5    | 116  | 40    | 161    |
| April.....    | 7    | 36   | ..... | 43     | October..... | 4    | 102  | 33    | 139    |
| May.....      | 8    | 49   | 1     | 58     | November ..  | 8    | 67   | 27    | 102    |
| June.....     | 18   | 66   | 9     | 93     | December ..  | 8    | 66   | 23    | 97     |
|               |      |      |       |        | 1901.        |      |      |       |        |
| July.....     | 10   | 58   | 5     | 71     | January .... | 12   | 50   | 27    | 89     |

A comparison of the monthly totals for the last three years shows that a slight rise usually occurs in the number of preparations submitted during the spring, and a much greater rise in the early fall.

**Table No. II. — Typhoid.**

SHOWING TOTAL WIDAL TESTS.

| Positive. | Negative. | Unsatisfactory. | Total. |
|-----------|-----------|-----------------|--------|
| 98        | 701       | 215             | 1,014  |
| 9.6%      | 69.1%     | 21.3%           | 100%   |

**Table No. III. — Typhoid.**

SHOWING CASES CLASSIFIED.

| Positive. | Negative. | Unsatisfactory. | Total. |
|-----------|-----------|-----------------|--------|
| 97        | 566       | 100             | 763    |
| 12.7%     | 74.2%     | 13.1%           | 100%   |



**Table No. IV.—Typhoid.**

SHOWING ALL POSITIVE CASES, INCLUDING THOSE ON WHICH THE EARLIER EXAMINATIONS WERE NOT POSITIVE.

|                                                                    | Number of Cases. | Percentage. |
|--------------------------------------------------------------------|------------------|-------------|
| Positive on first preparation.....                                 | 80               | 81.6%       |
| Positive on second preparation after atypical.....                 | 9                | 9.2%        |
| Positive on second preparation after one negative.....             | 6                | 6.1%        |
| Positive on third preparation after two negatives.....             | 1                | .....       |
| Positive on third preparation after one negative and atypical..... | 1                | .....       |
| Total.....                                                         | 97               |             |

**Table No. V.—Typhoid.**

SHOWING CLINICAL DIAGNOSIS IN CASES YIELDING POSITIVE WIDAL REACTION.

|                                          | Cases. |
|------------------------------------------|--------|
| Clinical diagnosis, positive.....        | 46     |
| “ “ negative.....                        | 4      |
| “ “ doubtful.....                        | 32     |
| “ “ not given.....                       | 15     |
| Bacteriological diagnosis, positive..... | 97     |

The concordance of positive bacteriological with positive clinical typhoid diagnosis ranges from 40 to 50% as shown by a comparison of results for the last 3 years.

**Table No. VI.—Typhoid.**

SHOWING ATYPICAL RESULTS AND THEIR RELATION TO PREVIOUS AND SUBSEQUENT EXAMINATIONS.

|                                                                             | Cases |                                           | Cases. |
|-----------------------------------------------------------------------------|-------|-------------------------------------------|--------|
| Atypical results preceded by a positive result,                             | 2     | Associated with positive results.....     | 12     |
| Atypical results followed by a positive result,                             | 10    |                                           |        |
| Atypical results preceded by one or more negative results.....              | 29    |                                           |        |
| Atypical results followed by one or more negative results.....              | 31    | Associated only with negative results.... | 71     |
| Atypical results preceded and followed by one or more negative results..... | 11    |                                           |        |
| Atypical results followed by atypical results only.....                     | 16    | Associated only with atypical results.... | 16     |
| Atypical results, (only one preparation submitted).....                     | 84    |                                           |        |

An inspection of this table shows that atypical results are more often associated with negative than with positive results.

**Table No. VII.—Typhoid.**

SHOWING NEGATIVE RESULTS CLASSIFIED.

|                                                                              |     |
|------------------------------------------------------------------------------|-----|
| Negative on first examination (only one preparation submitted).....          | 416 |
| Negative on first examination and on one or more subsequent preparations.... | 79  |
| Negative results associated with atypical results.....                       | 71  |
| Total negative results.....                                                  | 566 |

**Table No. VIII.—Typhoid.**

SHOWING RELATION OF ENLARGED SPLEEN AND PRESENCE OF ROSE SPOTS TO POSITIVE RESULTS.

|                                     | Totals. | ROSE SPOTS. |         |           |            |
|-------------------------------------|---------|-------------|---------|-----------|------------|
|                                     |         | Present.    | Absent. | Doubtful. | Not Given. |
| Spleen enlarged.....                | 32      | 19          | 8       | 4         | 1          |
| Spleen not enlarged.....            | 47      | 10          | 30      | 7         | .....      |
| Question of spleen enlargement..... | 11      | 3           | 5       | 3         | .....      |
| Condition of spleen not given..     | 7       | 2           | 2       | 3         | .....      |
| Totals.....                         | 97      | 34          | 45      | 17        | 1          |

**Table No. IX.—Typhoid.**

SHOWING DAY OF DISEASE (AS GIVEN BY PHYSICIAN) ON WHICH POSITIVE RESULTS WERE OBTAINED.

|                     |           | POSITIVE ON<br>FIRST<br>EXAMINATION. | POSITIVE ON<br>SECOND<br>EXAMINATION. | POSITIVE ON<br>THIRD<br>EXAMINATION. |
|---------------------|-----------|--------------------------------------|---------------------------------------|--------------------------------------|
|                     |           | Number of Cases.                     | Number of Cases.                      | Number of Cases.                     |
| Days.....           | 2         | 1                                    | .....                                 | .....                                |
| ".....              | 3         | .....                                | .....                                 | .....                                |
| ".....              | 4         | 1                                    | .....                                 | .....                                |
| ".....              | 5         | 2                                    | .....                                 | 1                                    |
| ".....              | 6         | 7                                    | .....                                 | .....                                |
| ".....              | 7         | 8                                    | .....                                 | .....                                |
| ".....              | 8         | 4                                    | 4                                     | .....                                |
| ".....              | 9         | 9                                    | 3                                     | .....                                |
| ".....              | 10        | 13                                   | 2                                     | 1                                    |
| ".....              | 11        | 3                                    | 3                                     | .....                                |
| ".....              | 12        | 5                                    | .....                                 | 1                                    |
| ".....              | 13        | .....                                | 1                                     | .....                                |
| ".....              | 14        | 5                                    | .....                                 | .....                                |
| ".....              | 15        | 2                                    | .....                                 | .....                                |
| ".....              | 16        | 1                                    | .....                                 | .....                                |
| ".....              | 18        | .....                                | 1                                     | .....                                |
| ".....              | 20        | 1                                    | 1                                     | .....                                |
| ".....              | 21        | 5                                    | .....                                 | .....                                |
| ".....              | 28        | 1                                    | .....                                 | .....                                |
| ".....              | 42        | 1                                    | .....                                 | .....                                |
| ".....              | 57        | .....                                | 1                                     | .....                                |
| ".....              | Not given | 8                                    | 1                                     | .....                                |
| Total cases 97..... |           | 77                                   | 17                                    | 3                                    |

**Table No. I.—Glanders.**  
MONTHLY TOTALS OF GUINEA-PIG TESTS.

|                                     | Positive. | Negative. | Unsatisfactory. |
|-------------------------------------|-----------|-----------|-----------------|
| 1900. February.....                 | 9         | 3         | 1               |
| March.....                          | 1         | 4         | 1               |
| April.....                          | 6         | 2         | 1               |
| May.....                            | 2         | 4         | 2               |
| June.....                           | 1         |           | 7               |
| July.....                           | 5         |           | 1               |
| August.....                         | 1         | 7         | 2               |
| September.....                      | 5         | 6         | 4               |
| October.....                        | 4         | 2         | 4               |
| November.....                       | 4         | 8         | 8               |
| December.....                       | 6         | 3         | 2               |
| 1901. January.....                  | 2         | 2         |                 |
| Total Guinea-Pig tests....          | 46        | 41        | 32              |
| Horses examined by these tests..... | 42        | 38        | 17              |

**Table No. II.—Glanders.**

SHOWING ALL POSITIVE CASES, INCLUDING THOSE ON WHICH THE EARLIER  
GUINEA-PIG TESTS WERE NOT POSITIVE.

|                                                                          |    |       |
|--------------------------------------------------------------------------|----|-------|
| Positive on first test.....                                              | 42 | 68.8% |
| Positive on second test (first test unsatisfactory).....                 | 1  | 1.6%  |
| Positive on third test (first test negative).....                        | 2  | 3.2%  |
| Final clinical diagnosis positive; tests negative or unsatisfactory..... | 16 | 26.4% |
| Total positive cases, January 1 to December 31, 1900.....                | 61 |       |

NOTE.—Twenty-five negative and fourteen unsatisfactory cases failed to show glanders clinically subsequently.

**Table No. III.—Glanders.**

SHOWING COMPARISON BETWEEN CLINICAL DIAGNOSIS AND GUINEA-PIG TEST.

| CLINICAL DIAGNOSIS (IN HORSE).             | GUINEA-PIG TEST. |                 |                 |        |
|--------------------------------------------|------------------|-----------------|-----------------|--------|
|                                            | Pos.             | Neg.            | Unsat.          | Total. |
| Positive.....                              | 15               | 8 <sup>4</sup>  | 6 <sup>1</sup>  | 29     |
| Negative.....                              |                  | 6               | 2 <sup>2</sup>  | 8      |
| Doubtful.....                              | 30               | 19 <sup>5</sup> | 14 <sup>3</sup> | 63     |
| Total, January 1 to December 31, 1900..... | 45               | 33              | 22              | 100    |

Hence 48 per cent. of these cases, which the attending veterinarian could not decide from clinical evidence at the time, were shown to be glanders by the guinea-pig test. These cases, in the absence of the guinea-pig test, would have remained amongst other horses until typical clinical symptoms developed, acting as sources of infection in the interim.

<sup>1</sup> Clinical evidence of glanders developed later in three of these six cases.

<sup>2</sup> Clinical evidence of glanders developed later in one of these two cases.

<sup>3</sup> Clinical evidence of glanders developed later in five of these fourteen cases.

<sup>4</sup> Clinical evidence of glanders developed later in one of these eight cases.

<sup>5</sup> Clinical evidence of glanders developed later in six of these nineteen cases.

Thus, about 25 per cent. of the finally positive cases tested failed of detection by guinea-pig test.

**Table No. IV. — Glanders.**

SHOWING TIME OCCUPIED IN GUINEA-PIG TESTS.

|                                                                                                                                              | 2 days. | 3 days. | 4 days. | 5 days. | 6 days. | 7 days. | 8 days. |
|----------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Number of guinea-pigs, showing intervals stated between inoculation and development of typical symptoms, January 1 to December 31, 1900..... | 8       | 16      | 15      | 3       | 2       | 1       | 1       |

After the typical symptoms developed, and autopsy was performed, one or two days elapsed in each case before the report was available, to allow the potato cultures made at autopsy to develop.

**Table No. V. — Glanders.**

SHOWING TIME OF DEATH OF GUINEA-PIGS AFTER INOCULATION IN THOSE CASES WHERE DEATH OCCURRED FROM PERITONITIS.

| NUMBER OF GUINEA-PIGS DYING OF PERITONITIS. | DEATH OCCURRED IN |           |             |            |
|---------------------------------------------|-------------------|-----------|-------------|------------|
|                                             | One day.          | Two Days. | Three Days. | Four Days. |
| 33                                          | 15                | 12        | 4           | 2          |

**Table No. VI. — Glanders.**

SHOWING COMPARISON BETWEEN MALLEIN TEST AND GUINEA-PIG TEST.

| MALLEIN TEST.                              | GUINEA-PIG TEST. |       |                |                |
|--------------------------------------------|------------------|-------|----------------|----------------|
|                                            | Total.           | Pos.  | Neg.           | Unsat.         |
| Positive.....                              | 39               | 23    | 7 <sup>1</sup> | 9 <sup>2</sup> |
| Negative.....                              | 15               | ..... | 11             | 4              |
| Unsatisfactory.....                        | 8                | 2     | 1 <sup>3</sup> | .....          |
| Total, January 1 to December 31, 1900..... | 57               | 25    | 19             | 13             |

<sup>1</sup> Clinical evidence later showed glanders in five of these seven cases.

<sup>2</sup> Clinical evidence later showed glanders in seven of these nine cases.

<sup>3</sup> Clinical evidence later showed glanders in this case.

**Table No. VII. — Glanders.**

SHOWING LESIONS FROM WHICH GUINEA-PIG TESTS WERE MADE.

|                                                                                       | Pos. | Neg.  | Unsat. | Total. |
|---------------------------------------------------------------------------------------|------|-------|--------|--------|
| Nasal discharge.....                                                                  | 26   | 27    | 19     | 72     |
| Ulcers on leg.....                                                                    | 12   | 4     | 3      | 19     |
| Ulcers on thorax.....                                                                 | 1    | ..... | .....  | 1      |
| Ulcers on neck.....                                                                   | 2    | ..... | .....  | 2      |
| Deposit in lung.....                                                                  | 2    | 1     | .....  | 3      |
| Face, shoulders, hip and submax. and mediast. glands, <sup>1</sup> one case each..... | 3    | 1     | .....  | 4      |
| Totals.....                                                                           | 46   | 33    | 22     | 101    |

In one case both leg and nose of same horse yielded positive results.

<sup>1</sup> Autopsy.

REPORT OF MEDICAL INSPECTOR.

---

*To the Board of Health :*

GENTLEMEN, — I have the honor to submit the following report for the year ending December 31, 1900 :

*Infectious Diseases.*

Fifty-three cases of eruptive diseases reported as small-pox have been examined during the year. Seven of these were found to be small-pox.

These cases were cared for, as is customary, by the Department, viz. : removal of patient to the hospital, thorough disinfection, vaccination and revaccination of all persons that have been in contact or exposed to patient, surveillance of suspects for two weeks, and a daily visit made until all danger has been removed.

Of these cases, numbering seven, there were no deaths.

Four thousand nine hundred and seventy-seven cases of diphtheria and 1,710 cases of scarlet fever were reported the past year. Each case has been investigated, and a report made whether or not the case was properly isolated. In many cases isolation was not approved, and these cases were sent to the hospital, and when necessary an order was obtained for a forcible removal.

During the past year 372 persons, dying without a physician in attendance, have been reported to this office. In all these cases a personal visit has been made, the body examined, and a probable diagnosis made before granting a permit for burial.

Seventeen cases have been referred to the Medical Examiner for investigation.

A tabular statement of the cases investigated is appended :

**Tabular Statement of the Cause of Deaths Investigated by Medical Inspector for the Year ending Dec. 31, 1900.**

| BERTILLON<br>CLASSIFICATION.                                          | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Total. |
|-----------------------------------------------------------------------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|--------|
| <b>I. General Diseases.</b>                                           |          |           |        |        |      |       |       |         |            |          |           |           |        |
| Measles .....                                                         | 1        |           |        |        |      |       |       |         |            |          |           |           | 1      |
| Scarlet fever .....                                                   |          |           |        |        |      |       |       |         |            |          | 1         |           | 1      |
| Whooping-cough .....                                                  |          |           | 2      |        |      |       | 1     |         |            |          |           |           | 3      |
| Diphtheria and croup .....                                            |          | 1         | 1      |        | 1    | 1     |       |         | 1          | 1        | 2         | 1         | 9      |
| Influenza .....                                                       |          |           | 1      |        |      |       |       |         |            |          |           |           | 1      |
| Tuberculosis: <i>a.</i> of the lungs, .....                           | 2        | 1         | 1      | 2      | 3    | 2     | 5     | 6       | 6          | 1        | 4         | 3         | 36     |
| <i>b.</i> general .....                                               | 2        |           |        |        |      | 1     |       | 2       |            |          | 1         |           | 6      |
| Cancer: <i>a.</i> of the mouth .....                                  |          |           |        |        |      |       |       |         |            |          | 1         |           | 1      |
| <i>b.</i> of the stomach .....                                        |          |           |        |        |      |       |       |         |            | 1        | 1         |           | 2      |
| <i>d.</i> of the breast .....                                         |          |           |        |        |      | 1     |       |         |            |          |           |           | 1      |
| <i>e.</i> others .....                                                | 1        | 1         | 1      |        |      | 2     | 1     |         |            |          |           |           | 6      |
| Diabetes .....                                                        |          |           |        |        |      |       |       | 1       |            |          |           |           | 1      |
| Total from general diseases .....                                     | 6        | 3         | 6      | 2      | 4    | 7     | 7     | 9       | 7          | 3        | 8         | 6         | 68     |
| <b>II. Diseases of the Nervous System and of the Organs of Sense.</b> |          |           |        |        |      |       |       |         |            |          |           |           |        |
| Simple meningitis .....                                               |          |           |        | 1      |      |       |       |         |            |          |           |           | 1      |
| Cerebral hemorrhage and congestion .....                              | 2        | 1         | 3      | 1      | 1    | 3     |       | 3       | 1          | 1        | 1         |           | 17     |
| Epilepsy .....                                                        |          |           |        | 2      |      |       |       |         |            | 1        |           | 1         | 4      |
| Convulsions of infants .....                                          | 2        | 1         | 1      |        | 3    | 3     | 1     | 1       | 5          |          | 1         | 5         | 23     |
| Other diseases of the nervous system .....                            |          |           |        |        |      |       |       | 1       |            |          |           |           | 1      |
| Total of the nervous system, etc. ....                                | 4        | 2         | 4      | 4      | 4    | 6     | 1     | 5       | 6          | 2        | 2         | 6         | 46     |
| <b>III. Diseases of the Circulatory System.</b>                       |          |           |        |        |      |       |       |         |            |          |           |           |        |
| Organic diseases of the heart, .....                                  | 4        | 6         | 6      | 3      | 9    | 5     | 5     | 9       | 3          | 7        | 4         | 7         | 68     |
| Angina pectoris .....                                                 | 1        | 1         |        |        |      |       |       |         |            |          |           |           | 2      |
| Diseases of the arteries .....                                        |          |           |        |        |      |       |       | 1       |            |          |           |           | 1      |
| Hemorrhage .....                                                      |          |           |        |        |      |       |       | 2       |            | 1        | 1         |           | 4      |
| Other diseases of the circulatory system .....                        | 3        | 1         | 1      | 2      |      |       |       |         |            |          |           |           | 7      |
| Total of the circulatory system .....                                 | 8        | 8         | 7      | 5      | 9    | 5     | 5     | 12      | 3          | 8        | 5         | 7         | 82     |
| Carried forward .....                                                 | 18       | 13        | 17     | 11     | 17   | 18    | 13    | 26      | 16         | 13       | 15        | 19        | 196    |

STATEMENT OF THE CAUSE OF DEATHS.— *Continued.*

| BERTILLON<br>CLASSIFICATION.                                      | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Total. |
|-------------------------------------------------------------------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|--------|
| <i>Brought forward</i> .....                                      | 18       | 13        | 17     | 11     | 17   | 18    | 13    | 26      | 16         | 13       | 15        | 19        | 196    |
| <b>IV. Diseases of the Respiratory System.</b>                    |          |           |        |        |      |       |       |         |            |          |           |           |        |
| Acute bronchitis.....                                             | 1        | 1         | ....   | 1      | .... | ....  | ....  | ....    | ....       | ....     | ....      | 1         | 4      |
| Chronic bronchitis.....                                           | ....     | 2         | 2      | ....   | .... | ....  | 1     | 2       | ....       | ....     | ....      | ....      | 7      |
| Broncho-pneumonia.....                                            | 1        | ....      | 2      | 2      | 1    | ....  | ....  | ....    | ....       | ....     | ....      | 3         | 9      |
| Pneumonia.....                                                    | 1        | 3         | 3      | ....   | 1    | 2     | ....  | ....    | 1          | ....     | 1         | ....      | 12     |
| Other diseases of the respiratory system (phthisis excepted)..... | ....     | ....      | 1      | ....   | .... | ....  | ....  | ....    | ....       | ....     | ....      | ....      | 1      |
| Total of the respiratory system.....                              | 3        | 6         | 8      | 3      | 2    | 2     | 1     | 2       | 1          | ....     | 1         | 4         | 33     |
| <b>V. Diseases of the Digestive System.</b>                       |          |           |        |        |      |       |       |         |            |          |           |           |        |
| Other diseases of the stomach (cancer excepted).....              | ....     | ....      | ....   | ....   | .... | ....  | ....  | ....    | ....       | ....     | ....      | 1         | 1      |
| Infantile diarrhoea, athrepsia.....                               | ....     | ....      | ....   | ....   | .... | 1     | 10    | 5       | 5          | 2        | 2         | ....      | 25     |
| Dysentery.....                                                    | ....     | ....      | ....   | ....   | .... | ....  | ....  | 1       | ....       | ....     | ....      | ....      | 1      |
| Inflammatory peritonitis (non-puerperal).....                     | ....     | ....      | ....   | ....   | .... | ....  | ....  | ....    | ....       | ....     | ....      | 1         | 1      |
| Total of the digestive system.....                                | ....     | ....      | ....   | ....   | .... | 1     | 10    | 6       | 5          | 2        | 2         | 2         | 28     |
| <b>VI. Diseases of the Genito-Urinary System and Adnexa.</b>      |          |           |        |        |      |       |       |         |            |          |           |           |        |
| Acute nephritis.....                                              | ....     | ....      | ....   | ....   | 1    | ....  | 1     | ....    | ....       | ....     | ....      | ....      | 2      |
| Bright's disease.....                                             | ....     | ....      | ....   | ....   | .... | ....  | 1     | ....    | 1          | ....     | 1         | ....      | 3      |
| Total genito-urinary system, etc.....                             | ....     | ....      | ....   | ....   | 1    | ....  | 2     | ....    | 1          | ....     | 1         | ....      | 5      |
| <b>VII. Puerperal Condition.</b>                                  |          |           |        |        |      |       |       |         |            |          |           |           |        |
| Other accidents of labor.....                                     | ....     | ....      | ....   | ....   | 1    | ....  | ....  | ....    | ....       | ....     | ....      | ....      | 1      |
| Total puerperal condition.....                                    | ....     | ....      | ....   | ....   | 1    | ....  | ....  | ....    | ....       | ....     | ....      | ....      | 1      |
| <b>VIII. Diseases of the Skin and Cellular Tissue.</b>            |          |           |        |        |      |       |       |         |            |          |           |           |        |
| Phlegmon, acute abscess. ..                                       | ....     | ....      | ....   | 1      | .... | ....  | ....  | ....    | ....       | ....     | ....      | ....      | 1      |
| Total of the skin and tissue cellular.....                        | ....     | ....      | ....   | 1      | .... | ....  | ....  | ....    | ....       | ....     | ....      | ....      | 1      |
| <i>Carried forward</i> .....                                      | 21       | 19        | 25     | 15     | 21   | 21    | 26    | 34      | 23         | 15       | 19        | 25        | 264    |

STATEMENT OF THE CAUSE OF DEATHS.— *Concluded.*

| BERTILLON<br>CLASSIFICATION.                     | January.  | February. | March.    | April.    | May.      | June.     | July.     | August.   | September. | October.  | November. | December. | Total.     |
|--------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|-----------|-----------|-----------|------------|
| <i>Brought forward.....</i>                      | 21        | 19        | 25        | 15        | 21        | 21        | 26        | 34        | 23         | 15        | 19        | 25        | 264        |
| <b>IX. Diseases of the Organs of Locomotion.</b> |           |           |           |           |           |           |           |           |            |           |           |           |            |
| <b>X. Malformations.</b>                         |           |           |           |           |           |           |           |           |            |           |           |           |            |
| Malformations.....                               | 1         | ...       | ...       | ...       | ...       | ...       | ...       | ...       | ...        | ...       | ...       | ...       | 1          |
| Total malformations.....                         | 1         | ...       | ...       | ...       | ...       | ...       | ...       | ...       | ...        | ...       | ...       | ...       | 1          |
| <b>XI. Infantile.</b>                            |           |           |           |           |           |           |           |           |            |           |           |           |            |
| Congenital debility, icterus, and sclerema.....  | 2         | 2         | 4         | ...       | 6         | 3         | 3         | 2         | 1          | 2         | 2         | 1         | 28         |
| Other diseases peculiar to infancy.....          | ...       | ...       | ...       | ...       | ...       | ...       | ...       | ...       | ...        | 1         | ...       | ...       | 1          |
| Total infantile.....                             | 2         | 2         | 4         | ...       | 6         | 3         | 3         | 2         | 1          | 3         | 2         | 1         | 29         |
| <b>XII. Old Age.</b>                             |           |           |           |           |           |           |           |           |            |           |           |           |            |
| Senile debility.....                             | 3         | ...       | 1         | 3         | 2         | ...       | 2         | ...       | 1          | ...       | 3         | ...       | 15         |
| Total from old age.....                          | 3         | ...       | 1         | 3         | 2         | ...       | 2         | ...       | 1          | ...       | 3         | ...       | 15         |
| <b>XIII. External Violence.</b>                  |           |           |           |           |           |           |           |           |            |           |           |           |            |
| Other accidental injuries.....                   | ...       | ...       | ...       | 1         | ...       | ...       | ...       | 1         | ...        | 1         | 1         | 2         | 6          |
| Sunstroke and freezing.....                      | ...       | ...       | ...       | ...       | ...       | ...       | ...       | 1         | ...        | ...       | ...       | ...       | 1          |
| Total from external violence.....                | ...       | ...       | ...       | 1         | ...       | ...       | ...       | 2         | ...        | 1         | 1         | 2         | 7          |
| <b>XIV. Ill-Defined Diseases.</b>                |           |           |           |           |           |           |           |           |            |           |           |           |            |
| Asphyxia, cyanosis.....                          | ...       | ...       | ...       | 1         | ...       | ...       | ...       | ...       | ...        | ...       | ...       | ...       | 1          |
| Unknown or not specified diseases.....           | 4         | 3         | 1         | ...       | 4         | 5         | 4         | 1         | 1          | 4         | ...       | 1         | 28         |
| Total ill-defined diseases...                    | 4         | 3         | 1         | 1         | 4         | 5         | 4         | 1         | 1          | 4         | ...       | 1         | 29         |
| Still-births.....                                | ...       | 1         | 1         | 2         | 1         | ...       | 1         | 1         | 1          | 2         | ...       | ...       | 10         |
| Referred to medical examiner.....                | 1         | ...       | 3         | 1         | 2         | 1         | ...       | 1         | 3          | ...       | 2         | 3         | 17         |
| <b>Total.....</b>                                | <b>32</b> | <b>25</b> | <b>35</b> | <b>23</b> | <b>36</b> | <b>30</b> | <b>36</b> | <b>41</b> | <b>30</b>  | <b>25</b> | <b>27</b> | <b>32</b> | <b>372</b> |

<sup>1</sup>No deaths were examined in this group of diseases.

Respectfully submitted,

THOMAS B. SHEA, M.D.



## REPORT OF GEORGE A. SARGENT, M.D.

January 1, 1901.

*To the Board of Health:*

GENTLEMEN, — I have the honor to submit the following report for the year ending December 31, 1900:

There have been 4,118 persons vaccinated, and 1,042 certificates of vaccination have been issued. The City Prison has been visited on Sundays and holidays, where cases have been treated of abrasions, contusions, delirium tremens, dementia, epilepsy, fracture, sprain, incised wounds, lacerated wounds and scalp wounds. At the Chardon-street Home, cases have been attended of acne, anæmia, acute bronchitis, chronic bronchitis, broncho-pneumonia, child-bed, colds, conjunctivitis, contusions, cystitis, debility, delirium tremens, dementia, gastro-intestinal catarrh, hysteria, icterus, incised wounds, melæna neonatorum, neuralgia, abdominal tumor, otorrhoea, paronychia, stomatitis, syphilis, thrush, urticaria, and varicella.

Suffolk County Jail — One thousand seven hundred and eighty-six patients have been treated, the number of visits required being 3,236. There were three deaths, and two patients were sent to the hospital.

A tabular statement is appended of cases at jail.

Respectfully submitted,

GEORGE A. SARGENT, M.D.

**Tabular Statement of the Diseases Treated at Suffolk County Jail for the Year Ending December 31, 1900.**

| DISEASES.                                     | Remaining<br>Jan. 1, 1900. | Treated during<br>year. | Recovered. | Improved. | Sent to Hospital. | Sent to Insane<br>Asylum. | Sent to Foxboro'. | Discharged from<br>custody. | Deaths. | Remaining<br>Dec. 31, 1900. |
|-----------------------------------------------|----------------------------|-------------------------|------------|-----------|-------------------|---------------------------|-------------------|-----------------------------|---------|-----------------------------|
| <b>General Diseases:</b>                      |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Anæmia .....                                  |                            | 2                       |            | 2         |                   |                           |                   |                             |         |                             |
| Cold .....                                    |                            | 70                      | 70         |           |                   |                           |                   |                             |         |                             |
| Debility .....                                |                            | 52                      |            | 52        |                   |                           |                   |                             |         |                             |
| Fever, intermittent .....                     |                            | 18                      | 18         |           |                   |                           |                   |                             |         |                             |
| Phthisis pulmonalis .....                     |                            | 3                       |            |           |                   |                           |                   | 3                           |         |                             |
| Rheumatism, acute .....                       |                            | 13                      | 13         |           |                   |                           |                   |                             |         |                             |
| Rheumatism, chronic .....                     |                            | 116                     |            | 116       |                   |                           |                   |                             |         |                             |
| <b>Functional Diseases of Nervous System:</b> |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Delirium tremens .....                        |                            | 180                     | 180        |           |                   |                           |                   |                             |         |                             |
| Epilepsy .....                                |                            | 4                       |            | 4         |                   |                           |                   |                             |         |                             |
| Neuralgia .....                               |                            | 96                      | 50         | 46        |                   |                           |                   |                             |         |                             |
| <b>Organic Diseases of Nervous System:</b>    |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Sciatica .....                                |                            | 2                       | 1          |           |                   |                           |                   |                             |         | 1                           |
| <b>Diseases of the Intellect:</b>             |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Dementia .....                                |                            | 8                       |            |           |                   | 3                         |                   |                             |         |                             |
| Dipsomania .....                              |                            | 1                       |            |           |                   |                           | 1                 |                             |         |                             |
| <b>Diseases of Circulatory System:</b>        |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Cerebral hemorrhage .....                     |                            | 1                       |            |           | 1                 |                           |                   |                             |         |                             |
| <b>Diseases of the Heart:</b>                 |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Functional .....                              |                            | 1                       |            | 1         |                   |                           |                   |                             |         |                             |
| <b>Organic Diseases of the Heart:</b>         |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Endocarditis .....                            |                            | 3                       |            | 1         |                   |                           |                   | 1                           | 1       |                             |
| Pericarditis .....                            |                            | 1                       |            |           |                   |                           |                   | 1                           |         |                             |
| <b>Diseases of Bronchi:</b>                   |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Asthma .....                                  |                            | 1                       |            | 1         |                   |                           |                   |                             |         |                             |
| Bronchitis, acute .....                       |                            | 28                      | 28         |           |                   |                           |                   |                             |         |                             |
| Bronchitis, chronic .....                     |                            | 1                       |            |           |                   |                           |                   |                             |         | 1                           |
| <b>Diseases of Lungs:</b>                     |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Pleurisy .....                                |                            | 1                       |            | 1         |                   |                           |                   |                             |         |                             |
| Pneumonia .....                               |                            | 3                       |            |           | 1                 |                           |                   |                             | 2       |                             |
| <i>Carried forward</i> .....                  |                            | 545                     | 305        | 224       | 2                 | 3                         | 1                 | 5                           | 3       | 2                           |

STATEMENT OF THE DISEASES TREATED. — *Continued.*

| DISEASES.                            | Remaining<br>Jan. 1, 1900. | Treated during<br>year. | Recovered. | Improved. | Sent to Hospital. | Sent to Insane<br>Asylum. | Sent to Foxboro'. | Discharged from<br>custody. | Deaths. | Remaining<br>Dec. 31, 1900. |
|--------------------------------------|----------------------------|-------------------------|------------|-----------|-------------------|---------------------------|-------------------|-----------------------------|---------|-----------------------------|
| <i>Brought forward</i> .....         |                            | 545                     | 305        | 224       | 2                 | 3                         | 1                 | 5                           | 3       | 2                           |
| <b>Diseases of Fauces:</b>           |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Pharyngitis .....                    |                            | 11                      | 11         |           |                   |                           |                   |                             |         |                             |
| Stomatitis .....                     |                            | 3                       | 3          |           |                   |                           |                   |                             |         |                             |
| Tonsillitis, follicular .....        |                            | 8                       | 8          |           |                   |                           |                   |                             |         |                             |
| <b>Diseases of Larynx:</b>           |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Laryngitis .....                     |                            | 1                       | 1          |           |                   |                           |                   |                             |         |                             |
| <b>Diseases of Digestive System:</b> |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Colic .....                          |                            | 12                      | 12         |           |                   |                           |                   |                             |         |                             |
| Constipation .....                   |                            | 489                     | 489        |           |                   |                           |                   |                             |         |                             |
| Diarrhoea .....                      |                            | 118                     | 118        |           |                   |                           |                   |                             |         |                             |
| Dyspepsia .....                      |                            | 75                      |            | 75        |                   |                           |                   |                             |         |                             |
| Gastro-intestinal catarrh .....      |                            | 1                       |            | 1         |                   |                           |                   |                             |         |                             |
| <b>Functional Diseases of Women:</b> |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Dysmenorrhoea .....                  |                            | 2                       |            | 2         |                   |                           |                   |                             |         |                             |
| Menorrhagia .....                    |                            | 3                       |            | 3         |                   |                           |                   |                             |         |                             |
| Metrorrhagia .....                   |                            | 4                       |            | 4         |                   |                           |                   |                             |         |                             |
| <b>Diseases of Kidneys:</b>          |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Nephritis .....                      |                            | 1                       |            |           |                   |                           | 1                 |                             |         |                             |
| <b>Diseases of Cutaneous System:</b> |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Acne .....                           |                            | 2                       |            | 2         |                   |                           |                   |                             |         |                             |
| Dermatitis .....                     |                            | 3                       | 3          |           |                   |                           |                   |                             |         |                             |
| Eczema .....                         |                            | 9                       |            | 9         |                   |                           |                   |                             |         |                             |
| Furuncle .....                       |                            | 4                       | 4          |           |                   |                           |                   |                             |         |                             |
| Herpes .....                         |                            | 2                       | 1          |           |                   |                           |                   |                             |         | 1                           |
| Paronychia .....                     |                            | 3                       | 3          |           |                   |                           |                   |                             |         |                             |
| Phthiriasis .....                    |                            | 22                      | 22         |           |                   |                           |                   |                             |         |                             |
| Psoriasis .....                      |                            | 1                       |            | 1         |                   |                           |                   |                             |         |                             |
| Scabies .....                        |                            | 17                      | 17         |           |                   |                           |                   |                             |         |                             |
| Seborrhoea .....                     |                            | 2                       |            | 2         |                   |                           |                   |                             |         |                             |
| Urticaria .....                      |                            | 2                       | 2          |           |                   |                           |                   |                             |         |                             |
| <b>Exanthematoris Diseases:</b>      |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Measles .....                        |                            | 1                       | 1          |           |                   |                           |                   |                             |         |                             |
| <i>Carried forward</i> .....         |                            | 1,341                   | 1,000      | 323       | 2                 | 3                         | 1                 | 6                           | 3       | 3                           |

STATEMENT OF THE DISEASES TREATED.—*Concluded.*

| DISEASES.                    | Remaining<br>Jan. 1, 1900. | Treated during<br>year. | Recovered. | Improved. | Sent to Hospital. | Sent to Insane<br>Asylum. | Sent to Foxboro'. | Discharged from<br>custody. | Deaths. | Remaining<br>Dec. 31, 1900. |
|------------------------------|----------------------------|-------------------------|------------|-----------|-------------------|---------------------------|-------------------|-----------------------------|---------|-----------------------------|
| <i>Brought forward</i> ..... |                            | 1,341                   | 1,000      | 323       | 2                 | 3                         | 1                 | 6                           | 3       | 3                           |
| Diseases of Eye:             |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Conjunctivitis .....         |                            | 26                      | 26         |           |                   |                           |                   |                             |         |                             |
| Poisons:                     |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Opium habit .....            |                            | 14                      |            |           |                   |                           |                   | 14                          |         |                             |
| Surgical Diseases:           |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Abscess .....                |                            | 36                      | 36         |           |                   |                           |                   |                             |         |                             |
| Adenitis .....               |                            | 1                       |            | 1         |                   |                           |                   |                             |         |                             |
| Chancroid .....              |                            | 2                       |            | 2         |                   |                           |                   |                             |         |                             |
| Chronic ulcer .....          |                            | 5                       |            | 5         |                   |                           |                   |                             |         |                             |
| Erysipelas .....             |                            | 1                       | 1          |           |                   |                           |                   |                             |         |                             |
| Gonorrhœa .....              | 3                          | 76                      | 20         | 55        |                   |                           |                   |                             |         | 4                           |
| Hæmorrhoids .....            |                            | 3                       |            | 3         |                   |                           |                   |                             |         |                             |
| Hernia .....                 |                            | 4                       |            | 4         |                   |                           |                   |                             |         |                             |
| Hydrocele .....              |                            | 3                       |            | 3         |                   |                           |                   |                             |         |                             |
| Leucorrhœa .....             |                            | 2                       |            | 2         |                   |                           |                   |                             |         |                             |
| Mastitis .....               |                            | 1                       | 1          |           |                   |                           |                   |                             |         |                             |
| Otitis .....                 |                            | 6                       | 6          |           |                   |                           |                   |                             |         |                             |
| Paraphimosis .....           |                            | 1                       | 1          |           |                   |                           |                   |                             |         |                             |
| Syphilis .....               | 5                          | 51                      |            | 52        |                   |                           |                   |                             |         | 4                           |
| Injuries:                    |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Abrasions .....              |                            | 48                      | 48         |           |                   |                           |                   |                             |         |                             |
| Burns .....                  |                            | 2                       | 2          |           |                   |                           |                   |                             |         |                             |
| Contusions .....             |                            | 21                      | 21         |           |                   |                           |                   |                             |         |                             |
| Dislocations .....           |                            | 2                       | 2          |           |                   |                           |                   |                             |         |                             |
| Fractures .....              |                            | 4                       | 4          |           |                   |                           |                   |                             |         |                             |
| Sprains .....                |                            | 14                      | 14         |           |                   |                           |                   |                             |         |                             |
| Wounds:                      |                            |                         |            |           |                   |                           |                   |                             |         |                             |
| Gunshot .....                |                            | 1                       | 1          |           |                   |                           |                   |                             |         |                             |
| Incised .....                |                            | 12                      | 12         |           |                   |                           |                   |                             |         |                             |
| Lacerated .....              |                            | 24                      | 24         |           |                   |                           |                   |                             |         |                             |
| Scalp .....                  |                            | 45                      | 40         |           |                   |                           |                   | 5                           |         |                             |
| Total .....                  | 8                          | 1,746                   | 1,259      | 450       | 2                 | 3                         | 1                 | 25                          | 3       | 11                          |
| Malingering .....            |                            | 32                      |            |           |                   |                           |                   |                             |         |                             |
| Grand total .....            | 8                          | 1,778                   | 1,259      | 450       | 2                 | 3                         | 1                 | 25                          | 3       | 11                          |

## QUARANTINE DEPARTMENT.

*To the Board of Health:*

GENTLEMEN, — I herewith submit the following report of the Quarantine Department for the year ending December 31, 1900.

During the past year all vessels from foreign ports, with the exception of those from the British Maritime Provinces, were stopped for inspection; and in addition, from June 1 to November 1 all vessels from domestic ports south of Virginia were inspected.

During the year 697 vessels paid quarantine fees at this port, classified as follows:

|                     |       |
|---------------------|-------|
| Steamers . . . . .  | 553   |
| Schooners . . . . . | 90    |
| Barks . . . . .     | 39    |
| Ships . . . . .     | 8     |
| Brigs . . . . .     | 7     |
|                     | <hr/> |
|                     | 697   |

The quarantine fees collected were as follows:

|                                      |                        |
|--------------------------------------|------------------------|
| Vessels 500 tons and over . . . . .  | 605 @ \$8 = \$4,840 00 |
| Vessels 500 tons and under . . . . . | 92 @ 5 = 460 00        |
| Board . . . . .                      | 30 00                  |
| Disinfection . . . . .               | 135 00                 |

|                               |                   |
|-------------------------------|-------------------|
| Paid City Collector . . . . . | <u>\$5,465 00</u> |
|-------------------------------|-------------------|

The hospital report is as follows:

|                   | Admitted. | Discharged well. | Deaths. | In hospital Jan. 1, 1901. |
|-------------------|-----------|------------------|---------|---------------------------|
| Variola .....     | 2         | 2                | .....   | .....                     |
| Diphtheria .....  | 2         | 2                | .....   | .....                     |
| Leprosy .....     | 1         | .....            | .....   | 1                         |
| Observation ..... | 15        | 15               | .....   | .....                     |

September 12 steamship "Barrowmore," from London, arrived in quarantine with a case of variola on board. Case was removed, and vessel and crew treated according to United States Treasury regulations.

During the year a total of 26,984 passengers, 18,341 seamen and 3,312 cattlemen were inspected.

The hospitals and out-building at Gallop's Island are all in good condition.

Steamer "Vigilant" is in fair condition at present, but will probably need extensive repairs to the hull within a year or two.

Respectfully submitted,

PAUL CARSON.

## REPORT OF INSPECTOR OF ANIMALS.

BOSTON, January 1, 1901.

*To the Board of Health:*

GENTLEMEN,—I have the honor to submit the following report of the inspection of animals and dressed meat at the Brighton abattoir, and animals kept for the production of milk within the City, for the year ending December 31, 1900:

## ANIMALS KILLED AT ABATTOIR.

|                  |               |
|------------------|---------------|
| Cattle . . . . . | 22,680        |
| Calves . . . . . | 22,015        |
| Sheep . . . . .  | 14,891        |
| Swine . . . . .  | 26            |
| Total . . . . .  | <u>59,612</u> |

**Table No. I.**  
ANIMALS CONDEMNED.

|                                             | Number. | Weight.<br>(Pounds.) |
|---------------------------------------------|---------|----------------------|
| Cows.....                                   | 159     | 65,065               |
| Steers.....                                 | 2       | 1,400                |
| Bulls.....                                  |         |                      |
| Calves.....                                 | 1       | 30                   |
| Sheep.....                                  |         |                      |
| Swine.....                                  |         |                      |
| Parts of animals, including 623 livers..... |         | 12,460               |
| Total.....                                  | 162     | 78,955               |

Many of the smaller animals, as sheep, calves and swine, arrive at the slaughter-houses dead, and are at once prepared for rendering by the owners; such cases are not considered as seizures, and are not included in the table of animals seized and condemned.

"Parts of animals," in the above table, refers to animals where only a part of the same was condemned, the unmarketable portion being confined to the parts about the local lesion.

**Table No. II.**

**DISEASES FOUND AMONG ANIMALS AFTER HAVING BEEN KILLED AND DRESSED AT THE ABATTOIR NECESSITATING THE CONDEMNING OF THE CARCASSES.**

| DISEASES.                     | Cattle. | Calves. | Sheep. | Swine. |
|-------------------------------|---------|---------|--------|--------|
| Tuberculosis.....             | 150     | .....   | .....  | .....  |
| Septicemia.....               | 10      | .....   | .....  | .....  |
| General melanotic sarcoma.... | 1       | .....   | .....  | .....  |
| Immatured .....               | .....   | 1       | .....  | .....  |
| Total.....                    | 161     | 1       | .....  | .....  |

**Table No. III.**

**ANIMALS RECEIVED DEAD FROM THE STOCK-YARDS TO BE DRESSED FOR FOOD.**

| ANIMALS.     | Number Received. | Number Condemned. | Weight. |
|--------------|------------------|-------------------|---------|
| Cows.....    | 20               | 8                 | 3,445   |
| Bulls .....  | 4                | .....             | .....   |
| Steers ..... | 25               | 1                 | 820     |
| Total.....   | 49               | 9                 | 4,265   |

The above table refers to animals arriving at the different stock-yards which were unable to walk to the abattoir because of injury during transportation, or from what was supposed to be a slight illness; these were shot at the stock-yards, and carted to the abattoir in the ambulance.

Of the above forty-nine animals, thirty-three were found to be slightly injured, two were pregnant, three had laminitis, two were wild, and nine had septicemia, the last nine being condemned.

#### **TUBERCULOSIS.**

The following table shows the percentage of tuberculosis in cattle killed at the abattoir:



Table No. IV.

| CLASS OF ANIMALS.               | Number<br>Received. | Number<br>Tubercular. | Percentage. |
|---------------------------------|---------------------|-----------------------|-------------|
| Whole number of all kinds.....  | 22,680              | 310                   | 1.36        |
| Cows from Eastern States.....   | 6,336               | 308                   | 4.86        |
| Bulls from Eastern States.....  | 1,702               | .....                 | .....       |
| Cows from Western States.....   | 1,063               | .....                 | .....       |
| Bulls from Western States.....  | 60                  | .....                 | .....       |
| Steers from Western States..... | 13,517              | .....                 | .....       |
| Steers from Eastern States..... | .....               | 2                     | .....       |

Under the head of "Cows from Eastern States" is understood animals from all of the New England States, including Massachusetts.

By comparison of the above table, with table under the head of "Diseases found among animals after having been killed," etc., it will be seen that only 150 of the 310 cases of tuberculosis were condemned. This means that 160 of these cases were slight, and not condemnable under the act passed by the Legislature of 1898.

The total number (310) of tuberculous cattle found at the abattoir during the past year shows a large increase as compared with the total number (234) found during the year 1899. This, however, is due to the great increase in number (6,336) of Eastern cows killed during the past year as compared with the number (3,936) killed during the year 1899, although the percentage (4.86) of tuberculous Eastern cows found during the past year is lower than the percentage (5.89) found in the same class of animals for the year 1899.

#### INSPECTION OF CATTLE.

The inspection of cattle kept for the production of milk within the city limits has been continued as heretofore. All cattle that have, upon physical examination, shown any symptoms of tuberculosis have been subjected to the tuberculin test.

Forty-six animals have been tested with tuberculin, of which seven were found tuberculous and quarantined. These were at once reported to the Board of Cattle Commissioners in accordance with the Public Statutes.

During this inspection three cases of actinomycosis of the udder were found and reported to the Board of Cattle Commissioners.

Upon examination of the various dairies within the City

it was found that considerable improvement has been made in the condition of milk-rooms.

#### GLANDERS.

There have been reported by veterinarians to the Board of Health during the past year 224 horses under the suspicion of having glanders. Of these, 52 on examination were found to be affected with some non-contagious disease, and the remaining 172 proved to have glanders. Twenty-four of these cases, upon inquiry, were found to have been owned and stabled outside of Boston, or had been stabled in Boston for so short a time that no doubt existed but that the animals were infected with glanders before coming to Boston. The State Board of Cattle Commission were notified of such cases, thus enabling them to investigate.

In addition to the above cases of glanders reported to this office, the Board of Health, by examination of all animals in stables where a case of glanders occurred, and also in many other stables, found thirty-three cases of glanders, or 16 per cent. of the total number of cases, all of which would otherwise have remained in such stables, a constant danger to the other animals, for some time before being discovered by the owner.

During such stable inspections 4,500 horses have been examined. These examinations are made on Sundays only, as at no other time is it possible to find all animals in.

The following table shows the number of cases of glanders for each month during the past year:

Table No. V.

| MONTH.          | Cases reported. | Cases found by Board of Health. | Cases found which belonged in some other city. | Cases which, upon examination, were found not to be glanders. | Actual number of cases of glanders found in city. | Number of cases of glanders which belonged in Boston. | Number of stables in which glanders was found. |
|-----------------|-----------------|---------------------------------|------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------|------------------------------------------------|
| January .....   | 14              | 3                               | .....                                          | 3                                                             | 14                                                | 14                                                    | 15                                             |
| February .....  | 19              | 6                               | 3                                              | 2                                                             | 23                                                | 20                                                    | 17                                             |
| March .....     | 18              | 3                               | .....                                          | 6                                                             | 15                                                | 15                                                    | 14                                             |
| April .....     | 17              | 3                               | 5                                              | 3                                                             | 17                                                | 12                                                    | 16                                             |
| May .....       | 19              | 5                               | 3                                              | 3                                                             | 21                                                | 13                                                    | 16                                             |
| June .....      | 21              | 2                               | 2                                              | 8                                                             | 15                                                | 13                                                    | 17                                             |
| July .....      | 20              | .....                           | 1                                              | 3                                                             | 17                                                | 16                                                    | 17                                             |
| August .....    | 22              | .....                           | .....                                          | 9                                                             | 13                                                | 13                                                    | 13                                             |
| September ..... | 20              | 1                               | 3                                              | 4                                                             | 17                                                | 14                                                    | 14                                             |
| October .....   | 19              | 5                               | .....                                          | 4                                                             | 20                                                | 20                                                    | 18                                             |
| November .....  | 19              | 2                               | 1                                              | 4                                                             | 17                                                | 16                                                    | 16                                             |
| December .....  | 16              | 3                               | 1                                              | 3                                                             | 16                                                | 15                                                    | 14                                             |
| Total .....     | 224             | 33                              | 24                                             | 52                                                            | 205                                               | 181                                                   | 187                                            |

All stables in which glanders occurred during the past year have been thoroughly disinfected.

Mallein has been used to a considerable extent, particularly in such cases as were doubtful from a clinical standpoint, and where material for guinea-pig test was not available, as, for instance, where the only lesion to be discovered clinically was an enlarged sub-maxillary gland with no nasal discharge. Where it has been possible, all horses which have been associated with another animal having glanders, as, for instance, a mate working in the same team with a glandered horse, have been subjected to the mallein test. In such cases, where no symptoms are present and a reaction is made to mallein, the horses have been kept under strict observation by the Board of Health.

The following table shows, in a condensed form, the relation of the mallein test to the clinical diagnosis at the time of making the mallein test, and to the final diagnosis based on autopsy, guinea-pig test, or prolonged observations :

Table No. VI.

| 1.                     | 2.      |                             | 3.                                                           |       |                | 4.                          | 5.                                                           |      | 6.                          | 7.                                                           |      |                |
|------------------------|---------|-----------------------------|--------------------------------------------------------------|-------|----------------|-----------------------------|--------------------------------------------------------------|------|-----------------------------|--------------------------------------------------------------|------|----------------|
| CLINICAL<br>DIAGNOSIS. | Totals. | Mallein result<br>positive. | Final clinical<br>diagnosis on<br>positive mallein<br>tests. |       |                | Mallein result<br>negative. | Final clinical<br>diagnosis on<br>negative mallein<br>tests. |      | Mallein result<br>doubtful. | Final clinical<br>diagnosis on<br>doubtful mallein<br>tests. |      |                |
|                        |         |                             | Pos.                                                         | Neg.  | Doubt-<br>ful. |                             | Pos.                                                         | Neg. |                             | Pos.                                                         | Neg. | Doubt-<br>ful. |
|                        |         |                             |                                                              |       |                |                             |                                                              |      |                             |                                                              |      |                |
| Positive..             | 21      | 15                          | 13                                                           | 2     | .....          | 5                           | .....                                                        | 5    | 1                           | .....                                                        | 1    | .....          |
| Negative,              | 14      | 3                           | 3                                                            | ..... | .....          | 9                           | .....                                                        | 9    | 2                           | .....                                                        | 2    | .....          |
| Doubtful,              | 44      | 27                          | 22                                                           | 2     | 3              | 15                          | .....                                                        | 15   | 2                           | .....                                                        | 1    | 1              |
|                        | 79      | 45                          | 38                                                           | 4     | 3              | 29                          | .....                                                        | 29   | 5                           | .....                                                        | 4    | 1              |

The following table is similar to Table No. VI., but includes tests for the past two years :

Table No. VII.

| 1.                     | 2.      |                             | 3.                                                           |      |                | 4.                          | 5.                                                           |      | 6.                          | 7.                                                           |      |                |
|------------------------|---------|-----------------------------|--------------------------------------------------------------|------|----------------|-----------------------------|--------------------------------------------------------------|------|-----------------------------|--------------------------------------------------------------|------|----------------|
| CLINICAL<br>DIAGNOSIS. | Totals. | Mallein result<br>positive. | Final clinical<br>diagnosis on<br>positive mallein<br>tests. |      |                | Mallein result<br>negative. | Final clinical<br>diagnosis on<br>negative mallein<br>tests. |      | Mallein result<br>doubtful. | Final clinical<br>diagnosis on<br>doubtful mallein<br>tests. |      |                |
|                        |         |                             | Pos.                                                         | Neg. | Doubt-<br>ful. |                             | Pos.                                                         | Neg. |                             | Pos.                                                         | Neg. | Doubt-<br>ful. |
|                        |         |                             | Pos.                                                         | Neg. | Doubt-<br>ful. |                             | Pos.                                                         | Neg. |                             | Pos.                                                         | Neg. | Doubt-<br>ful. |
| Positive..             | 59      | 51                          | 49                                                           | 2    | .....          | 5                           | .....                                                        | 5    | 3                           | 2                                                            | 1    | .....          |
| Negative,              | 45      | 7                           | 5                                                            | 2    | .....          | 34                          | .....                                                        | 34   | 4                           | .....                                                        | 4    | .....          |
| Doubtful,              | 75      | 52                          | 42                                                           | 7    | 3              | 17                          | .....                                                        | 17   | 6                           | 2                                                            | 3    | 1              |
|                        | 179     | 110                         | 96                                                           | 11   | 3              | 56                          | .....                                                        | 56   | 13                          | 4                                                            | 8    | 1              |

*Column 1* shows the cases divided into positive, negative, and doubtful on clinical diagnosis.

*Column 2* shows the number positive mallein tests obtained from each of these divisions.

*Column 3* shows the final diagnosis on the animals, giving positive mallein test.

*Columns 4 and 6* give similarly the negative and doubtful mallein results.

*Columns 5 and 7* show the final diagnosis on these respectively.

The conclusions, which are the same as in 1899, drawn from tables numbered VI. and VII., are as follows:

1. All animals, whether suspected of glanders or not, failing to react to the mallein test, may be considered free from glanders. (See columns 4 and 5.)

2. Animals, whether suspected of glanders or not, reacting to the mallein test, may or may not be affected with glanders. (See columns 2 and 3.) It will be seen, however, that 87 per cent. of the animals giving a positive mallein reaction are affected with glanders.

3. Animals giving a doubtful reaction to the mallein test may or may not be affected with glanders. (See columns 6 and 7.)

Attention is called to the fact that the conclusions are drawn as a result of the above one hundred and seventy-nine cases. The following standards of reaction have been used, in the work of this Department, in all records, tables, etc., in this report relating to the mallein tests:

1. If the rise in temperature is  $1^{\circ}$  or less the reaction is negative unless the temperature before testing is  $104^{\circ}$  or more. (See below, 4.)

2. When the temperature before testing is not above  $102^{\circ}$  and during the test reaches  $104^{\circ}$  or more, the reaction is positive; but if, during the test, the temperature does not reach  $104^{\circ}$  (the rise, however, being more than  $1^{\circ}$ ) the reaction is doubtful.

3. When the temperature before testing is between  $102^{\circ}$  and  $104^{\circ}$  and, during the test, rises  $2^{\circ}$  or more, the reaction is positive, but if the rise is less than  $2^{\circ}$  (and more than  $1^{\circ}$ ) the reaction is doubtful.

4. If the temperature before testing is  $104^{\circ}$  or more, the test is of no value, since it is impossible to recognize whether the reaction is positive, negative, or doubtful.

## METHOD OF MAKING MALLEIN TEST.

Having, by previous examination, ascertained what the ordinary temperature of the suspected animal is, a subcutaneous injection of mallein is made in the thick portion of the neck. The reaction to mallein consists in a high rise of temperature with more or less swelling at the point of injection. The rise in temperature occurs usually in from six to eight hours, requiring the temperature to be taken within about six hours, and again thereafter about every three hours. A swelling at the point of injection is always present; but, if glanders is present, it is large, well marked, with abrupt edges. If glanders is not present, the swelling is small and flat. The results, where a reaction has taken place, usually runs somewhat as follows: Temperature at time of injection, 10 P.M., 101°; 5 A.M., 104°; 7 A.M., 105°; 9 A.M., 105°; 11 A.M., 105°; 5 P.M., 105°; in forty-eight hours, probably back to 102°. During the test, no water is allowed, but food given as usual.

The following table shows the relation between the temperature reaction and the reaction (swelling) at the point of injection during the mallein test.

Table No. VIII.

| TEMPERATURE REACTION. | Total. | REACTION AT POINT OF INJECTION. |           |
|-----------------------|--------|---------------------------------|-----------|
|                       |        | Typical.                        | Atypical. |
| Positive .....        | 45     | 38                              | 7         |
| Negative .....        | 29     | 1                               | 28        |
| Doubtful.....         | 5      | 2                               | 3         |
| Total.....            | 79     | 41                              | 38        |

*Guinea-Pig Test for Glanders.* — All animals reported to this office as suspected of having glanders, and which upon clinical examination were doubtful, although presenting a discharge either from the nose or a local ulcer, have been held for a guinea-pig test. The laboratory facilities of the Board of Health have been open to all veterinarians of the City for both the guinea-pig and mallein tests, but although these tests are valuable aids to diagnosis in suspected cases, the veterinarians have not availed themselves of this opportunity to any considerable extent.

The following table shows the comparison between the clinical diagnosis and the guinea-pig test:

Table No. IX.

| CLINICAL DIAGNOSIS (IN HORSE). | GUINEA-PIG TEST. |                 |                 |        |
|--------------------------------|------------------|-----------------|-----------------|--------|
|                                | Pos.             | Neg.            | Unsat.          | Total. |
| Positive.....                  | 15               | 8 <sup>4</sup>  | 6 <sup>1</sup>  | 29     |
| Negative.....                  |                  | 6               | 2 <sup>2</sup>  | 8      |
| Doubtful.....                  | 30               | 19 <sup>5</sup> | 14 <sup>3</sup> | 63     |
| Total.....                     | 45               | 33              | 22              | 100    |

Hence 47 per cent. of those cases which the attending veterinarian could not decide from clinical evidence at the time were shown to be glanders by the guinea-pig test. These cases, in the absence of the guinea-pig test, would have remained amongst other horses until typical clinical symptoms developed, acting as sources of infection in the interim.

<sup>1</sup> Clinical evidence of glanders developed later in three of these six cases.

<sup>2</sup> Clinical evidence of glanders developed later in one of these two cases.

<sup>3</sup> Clinical evidence of glanders developed later in five of these fourteen cases.

<sup>4</sup> Clinical evidence of glanders developed later in one of these eight cases.

<sup>5</sup> Clinical evidence of glanders developed later in six of these nineteen cases.

The following table shows the comparison between the mallein test and the guinea-pig test in cases where both tests were made:

Table No. X.

| MALLEIN TEST.       | GUINEA-PIG TEST. |                |                |        |
|---------------------|------------------|----------------|----------------|--------|
|                     | Pos.             | Neg.           | Unsat.         | Total. |
| Positive.....       | 23               | 7 <sup>1</sup> | 9 <sup>2</sup> | 39     |
| Negative.....       |                  | 11             | 4              | 15     |
| Unsatisfactory..... | 2                | 1 <sup>3</sup> |                | 3      |
| Total.....          | 25               | 19             | 13             | 57     |

<sup>1</sup> Clinical evidence later showed five of these seven cases to be glanders.

<sup>2</sup> Clinical evidence later showed seven of these nine cases to be glanders.

<sup>3</sup> Clinical evidence later showed this to be a case of glanders.

### *Rabies.*

During the past year two dogs suspected of having rabies have been reported to this office, both of which, upon examination, proved not to be rabid.

Respectfully submitted,

ALEXANDER BURR, M.D.V.,

*Inspector and Veterinarian.*

## REPORT OF THE INSPECTOR OF MILK AND VINEGAR.

---

BUREAU OF MILK INSPECTION,  
994 WASHINGTON STREET, BOSTON, MASS.

*To the Board of Health, Boston, Mass. :*

GENTLEMEN, — I beg to submit the following report on the work of the Bureau of Milk Inspection during the year ended January 31, 1901 :

The number of samples of milk examined was 13,978, of which, 8,149 were taken from milk wagons, 5,621 from shops and restaurants, and 208 were brought in by citizens. Of the total number, but 2 were found to contain added coloring matters, and only 13 contained preservatives. These 13 samples were obtained from seven dealers, all of whom were prosecuted and convicted.

The Legislature of 1900 passed no new laws relating to the sale and inspection of milk, but amended the existing statutes in the matter of the penalty for the first conviction for the sale of milk not of good standard quality or for custody or possession of the same with intent to sell. Hitherto the penalty has been a fine of not less than fifty nor more than two hundred dollars; under the amendment it is now not exceeding fifty dollars, and no minimum is given. The penalty for a second offence is unchanged; not less than one hundred nor more than three hundred dollars. No change was made in the penalty for the sale of milk to which coloring matters, preservatives or other foreign substances have been added.

The number of samples of butter, oleomargarine and cheese examined was 1,137, less than 50 of which proved to be oleomargarine, and these were mainly from restaurants and boarding houses where transient trade is solicited. An occasional fraudulent dealer doing business from a wagon strays into the City limits, but the business of selling the prohibited article as and for butter is practically dead. No new legislation was passed concerning butter and oleomargarine by the Legislature of 1900.

The number of samples of vinegar taken during the year was 805. As in former years the quality has been, in general, very high.

## SUMMARY OF SAMPLES EXAMINED.

|                                           |               |
|-------------------------------------------|---------------|
| Number of samples of milk . . . . .       | 13,978        |
| Number of samples of butter, etc. . . . . | 1,137         |
| Number of samples of vinegar . . . . .    | 805           |
| Total samples . . . . .                   | <u>15,920</u> |

## SUMMARY OF PROSECUTIONS.

|                                                                                                                       |            |
|-----------------------------------------------------------------------------------------------------------------------|------------|
| Possession or custody with intent to sell, or sale of milk not of good standard quality : . . . . .                   | 207        |
| Possession with intent to sell, of milk not of good standard quality and containing annatto coloring matter . . . . . | 1          |
| Possession with intent to sell, of milk containing annatto coloring matter . . . . .                                  | 1          |
| Possession with intent to sell, of milk containing formaldehyde . . . . .                                             | 13         |
| Sale of skimmed milk not of standard quality . . . . .                                                                | 4          |
| Sale of milk without being licensed . . . . .                                                                         | 36         |
| Serving oleomargarine without notification . . . . .                                                                  | 37         |
| Sale of oleomargarine made in imitation of yellow butter . . . . .                                                    | 5          |
| Sale of oleomargarine in an unmarked wrapper . . . . .                                                                | 1          |
| Sale of oleomargarine without being licensed . . . . .                                                                | 1          |
| Sale of oleomargarine from a wagon not properly marked . . . . .                                                      | 1          |
| Sale of molasses vinegar as and for cider vinegar . . . . .                                                           | 6          |
| Possession of adulterated cider-vinegar with intent to sell . . . . .                                                 | 6          |
| Possession of adulterated vinegar with intent to sell, . . . . .                                                      | 4          |
| Total complaints . . . . .                                                                                            | <u>323</u> |

## RESULTS OF PROSECUTIONS.

|                                                   |            |
|---------------------------------------------------|------------|
| Warrants returned without service . . . . .       | 7          |
| Cases <i>not pros'd</i> . . . . .                 | 15         |
| Defendants left the State pending trial . . . . . | 5          |
| Acquittals . . . . .                              | 9          |
| Convictions . . . . .                             | 287        |
|                                                   | <u>323</u> |

Amount paid in fines . . . . . \$6,721 00

Respectfully submitted,

CHARLES HARRINGTON,

*Inspector.*



## REPORT OF THE INSPECTOR OF PROVISIONS.

BOSTON, January 1, 1901.

*To the Board of Health :*

GENTLEMEN, — I herewith present my report of the inspection of provisions during the year 1900 :

Total number of packages seized and condemned, 3,211

## MEATS.

|                           |             |
|---------------------------|-------------|
| Beef, tainted . . . . .   | 720 pounds. |
| Ham, " . . . . .          | 378 "       |
| Pork, " . . . . .         | 250 "       |
| Poultry, " . . . . .      | 13,896 "    |
| Veal, immatured . . . . . | 7,624 "     |

## GAME.

|                   |     |
|-------------------|-----|
| Pigeons . . . . . | 291 |
|-------------------|-----|

## FISH.

|                          |             |
|--------------------------|-------------|
| Clams, tainted . . . . . | 20 bushels. |
| Haddock " . . . . .      | 610 pounds. |
| Cod " . . . . .          | 550 "       |
| Lobsters " . . . . .     | 350 "       |

## VEGETABLES.

|                                          |              |
|------------------------------------------|--------------|
| Apples . . . . .                         | 21 bushels.  |
| Asparagus . . . . .                      | 504 bunches. |
| Beans, 116 baskets . . . . .             | 51 barrels.  |
| Cranberries . . . . .                    | 700 quarts.  |
| Cucumbers, 14 crates, 1 barrel . . . . . | 16 bushels.  |
| Cabbage . . . . .                        | 1 crate.     |
| Egg plant, 4 baskets . . . . .           | 3 barrels.   |
| Melons, 119 crates, 40 barrels . . . . . | 10 baskets.  |
| Peas . . . . .                           | 49 bushels.  |
| Plums, 43 baskets . . . . .              | 2 crates.    |
| Peaches, 8 crates . . . . .              | 253 baskets. |
| Parsnips . . . . .                       | 10 barrels.  |

|              |   |   |   |   |   |   |             |
|--------------|---|---|---|---|---|---|-------------|
| Pears        | . | . | . | . | . | . | 84 bushels. |
| Peppers      | . | . | . | . | . | . | 15 "        |
| Potatoes     | . | . | . | . | . | . | 474 "       |
| Spinach      | . | . | . | . | . | . | 264 "       |
| Strawberries | . | . | . | . | . | . | 536 quarts. |
| Squash       | . | . | . | . | . | . | 2 crates.   |
| Turnips      | . | . | . | . | . | . | 1 barrel.   |
| Tomatoes     | . | . | . | . | . | . | 15 crates.  |
| Watermelons  | . | . | . | . | . | . | 1,576       |

#### DISPOSAL OF MILK PRODUCED AT THE BRIGHTON STOCK-YARDS.

August 31, 1900, the Board of Health passed the following regulation :

"No milk drawn from a cow in the City of Boston within forty-eight hours after said cow is brought into said City shall be sold or used for human food, and all milk drawn from any cow within forty-eight hours after said cow is brought into said City shall be destroyed within one hour after it is drawn from the cow."

In accordance with instructions from your honorable Board, I have caused the provisions of this regulation to be strictly enforced at the stock-yards in Brighton where, hitherto, there has been much cause for complaint.

This regulation prohibits the sale of milk from cows commonly known among cattle dealers as "bagged cows." By the term bagged cows is understood a cow in which the milk has been purposely allowed by the owner to remain in the udder beyond at least one regular time of milking, to give the udder a good, full appearance at the time of sale.

Wednesday is the stock-market day at the Brighton Stock-yards, and upon this day cattle dealers from all over New England gather to sell their cattle. All cattle, many of which are prepared for sale in the above mentioned manner, are usually sold within forty-eight hours after arriving at the yards. Thus this class of animals comes within the provisions of this regulation.

Previous to the passage of this regulation it was the custom, after the sale of each cow, to have such cow milked by some one employed by the cattle dealer, who was usually a milk pedler, and in some cases, women and boys of the neighborhood of the yards. Furthermore the care of such milk after having been drawn from the cow, was not in accordance with the milk regulations of the Board of Health.

By the enforcement of the above regulation the sale or use of all such milk whether from "bagged cows" or not, has been stopped.

Fruit and vegetables have been closely inspected at the wharves and depots on their arrival by steamship or railroad.

Respectfully submitted,

JOHN C. GROUSE,

*Inspector.*

## OFFICE OF THE SUPERINTENDENT OF PEDLERS.

---

CITY BUILDING, NORTH GROVE STREET,

February 1, 1901.

### *To the Board of Health:*

GENTLEMEN, — I have the honor to submit the following report, for the year ending January 31, 1901:

Licenses were granted to remove bones, grease, etc.: In March, 72; April, 2; May, 4; July, 2; August, 1; September, 3; October, 5; November, 3; December, 4; January, 8.

The renewals were: February, 67; April, 70; May, 72; June, 68; July, 68; August, 70; September, 71; October, 73; November, 63; December, 68; January, 71.

Numbers were assigned to pedlars, Chapter 47, Section 86, Revised Ordinances, 1898: March, 238; April, 165; May, 142; June, 101; July, 56; August, 63; September, 22; October, 20; November, 27; December, 21; January, 29.

Vehicles and receptacles inspected, and numbers approved: in February, 127; April, 278; May, 352; June, 360; July, 412; August, 476; September, 482; October, 453; November, 465; December, 456; January, 435.

The vehicles and receptacles used by pedlars and collectors of bones, grease, etc., licensed by this Board are in good condition; particular attention has been given as to cleanliness.

The City Collector received the past year \$1,825 for City licenses, \$248 for County licenses; a total of \$2,073, the smallest amount received in any year since 1893.

This is due to the system inaugurated by the Street Department in 1899. Over 1,500 permits were issued by the Street Department, which were supposed to expire December 1, 1899. Less than 1,100 pedlars were licensed by the Secretary of State and the Board of Health, many of whom did not have, or require a permit to sell on the street.

This shows that hundreds of unlicensed pedlars have been doing business illegally on permits and information from the Street Department. Permits which had expired on December 1, 1899, were extended to December 1, 1900, and a large

number of new permits were granted. Arrangements were made by which this Department would receive a list of these permits; but the list is incomplete and so unreliable as to be almost worthless. For this reason our record of pedlers now doing business in Boston is not complete.

I wish to call your attention to the fact that licenses are granted to pedlers who have not complied with the ordinances or statutes. For example: William Rattazo was given a permit to sell "All articles under Chapter 68, Section 1, of Public Statutes." His name is not recorded with the Board of Health, and he has not been assigned a number, as provided in Chapter 47, Section 86, Revised Ordinances, 1898.

Chalesto Pastore was given a permit to sell "An article manufactured by himself." He has no license as provided for in Chapter 68, Section 8, of the Public Statutes.

Ciracio Zarella was given a permit to sell "fruits, etc." He should have a license, as provided for in Chapter 68.

The granting of licenses by the Board of Aldermen to minors for the sale of buttons, badges, small-wares, etc., is said to be illegal by the Corporation Counsel, and has driven out of business a number of adult pedlers from whom the City had received a revenue.

The work of this Department has been to properly enforce the law, and every pedler found has had the law and ordinances explained to him, so that he might conform to all the requirements.

Licenses granted for the year were:

|                                                   |     |
|---------------------------------------------------|-----|
| County Licenses, issued by the Secretary of State | 62  |
| City licenses, " " " " " "                        | 73  |
| Tax-payers, licenses, " " " " " "                 | 102 |
| Licenses to remove grease, bones etc.             | 104 |
| Numbers assigned by Board of Health               | 884 |

Respectfully submitted,

JOHN McLOUGHLIN,

*Superintendent of Pedlers.*

NORTH GROVE STREET MORGUE.

---

BOSTON, January 20, 1901.

*To the Board of Health :*

GENTLEMEN, — I have the honor to report that for the year ending on the 31st of December, 1900, there were received and cared for by me as Superintendent of the City Morgue 128 bodies of persons deceased, a majority of which were unknown at the time of reception. All but 9 adults and 11 very small children were subsequently identified and claimed for burial by relatives and friends.

There was made by the Medical Examiner and his assistant 22 autopsies, at which I assisted.

Very respectfully,

FRED'K L. BRIGGS,

*Superintendent of City Morgue.*

## APPENDIX.

The following regulations, adopted from time to time by the Board of Health, are still in force :

## REMOVAL OF MANURE.

May 10, 1875.

*Ordered*, That no manure shall be removed except in a tight, canvas-covered vehicle, with the covering so secured to the sides and ends of the vehicle as to prevent the manure from being dropped or left in any street or way of the City in process of removal, and not loaded in or upon any street, lane, alley, or passageway or upon or across any sidewalk.

## OFFENSIVE TRADES.

August 7, 1878.

*Ordered*, That, after this date, the exercise of the trade or employment of manufacturing fertilizers or guano from fish or other animal matter within the limits of the City of Boston, except on the islands in the harbor, at the abattoir in the Brighton district, or such other places as may have been or may hereafter be assigned by said Board, such trade or employment being in the opinion of the Board a nuisance, hurtful to the inhabitants, the exercise of which is attended by noisome and injurious odors.

## PUBLIC FUNERALS.

November 21, 1882.

*Whereas*, The diseases designated as small-pox, scarlet fever, diphtheria, and typhus fever are contagious and dangerous to the public health, and have been, and may easily be, contracted at funerals from dead bodies or apartments which have been infected by such diseases ; it is, therefore,

*Ordered*, That from after this date no public funerals shall be held over the remains of any person having died of small-pox, scarlet fever, diphtheria, or typhus fever, without the written permit of the Board of Health, and under such regulations as may prevent the spread of either of said diseases.

*Ordered, further, that the remains of persons dying of either of said diseases shall at once be placed in a tight or sealed coffin, and shall not thereafter be exposed to view or disturbed except for burial.*

## UNDERTAKERS.

January 3, 1890.

The following Statute Law and the Regulation of the Board of Health is published for the information of Undertakers and others having charge of the burial of bodies :

### CHAPTER 124, COMMONWEALTH OF MASSACHUSETTS, IN THE YEAR 1883.

#### AN ACT RELATING TO THE REMOVAL AND TRANSPORTATION OF CERTAIN BODIES FOR BURIAL.

*Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows :*

SECTION 1. Section Five of Chapter 32 of the Public Statutes, relating to the burial or removal of bodies for burial, is amended by inserting in the eleventh line thereof, after the word "bury" the words "or remove."

SECT. 2. No railroad corporation, or other common carrier or person, shall convey or cause to be conveyed, through or from any city or town in this Commonwealth, the remains of any person who has died of small-pox, scarlet fever, diphtheria, or typhoid fever, until such body has been so encased and prepared as to preclude any danger of communicating the disease to others by its transportation, and no local registrar or clerk shall give a permit for the removal of such body until he has received from the Board of Health of the city, or the Selectmen of the town where the death occurred, a certificate, stating the cause of death, and that said body has been prepared in the manner set forth in this section, which certificate shall be delivered to the agent or person who receives the body.

SECT. 3. This Act shall take effect upon its passage.

## REGULATION.

IN BOARD OF HEALTH, January 3, 1890.

In pursuance of the above law the Board of Health makes the following regulation:

*Ordered, That the bodies of all persons dying from small-pox, diphtheria, membranous croup, scarlet fever, or typhus fever must immediately be prepared for the coffin, wrapped in a sheet saturated in a 10% solution of chloride of zinc and placed in a coffin, which must be made absolutely tight, and which must not be reopened.*

INSTRUCTIONS. — It will be necessary for Undertakers to first comply with the above Law and Regulation, and then certify the same to this Board. The Board of Health will thereupon issue the required certificate.

Blanks for the Undertakers' use will be furnished at this office.



INSTRUCTIONS TO SUPERINTENDENTS OF CEMETERIES  
AND UNDERTAKERS.

October 1, 1899.

In disintering the remains of persons who have died from any infectious disease the following instructions must be followed:

After excavating the earth to within six inches of the coffin or box containing an infected body, the box and earth upon it must be saturated with a solution of fresh chloride of lime (one-half pound to a gallon of water), and when the box containing the body is raised or handled it must be thoroughly washed with the same solution. No such body shall be removed except in a tightly sealed and suitable box.

No person will be allowed to disinter or remove the remains of any person who has died of small-pox without first having been vaccinated very recently and to the satisfaction of the Board of Health.

## WALL DRAPERIES.

October 11, 1898.

At a meeting of the Board of Health, this day, the following regulation was passed:

"The Board of Health hereby adjudges that the use of 'Wall Draperies' at funerals is a source of filth and cause of sickness, and hereby orders: That the use of such draperies in any room or place used for a funeral or for the preparation or retention of any human body before or in connection with such funeral, be and hereby is, forbidden."

## Cows.

April 26, 1892.

*Whereas*, Cows' milk is one of the most common and necessary articles of food, and is oftentimes seriously impaired in usefulness and rendered dangerous to health by the want of proper care in its production or subsequent treatment or handling; it is, therefore, ordered that the following regulation be and is hereby adopted:

SECTION 1. No person shall use any building as a stable for cows unless it contains at least 1,000 cubic feet of space for each animal, is well lighted and ventilated, has tight roof and floors, good drainage, a supply of pure water, and all other necessary means for maintaining the health and good condition of the cows, and has been approved by the Board of Health.

SECT. 2. Every person using any such building shall keep the same and the premises connected therewith, and all land used for pasturage of the cows, clean and free from filth.

SECT. 3. Every person keeping a milch cow shall permit it to be examined from time to time, as to its freedom from disease, by a veterinarian designated by the Board of Health.

SECT. 4. No person having an infectious disease, or having recently been in contact with any such person, shall milk cows or handle cans, measures, or other vessels used for milk intended for sale, or in any way take part or assist in handling milk intended for sale, until all danger of communicating such disease to other persons shall have passed.

SECT. 5. No person shall sell or use for human food the milk of a diseased cow, or permit such milk to be mixed with other milk, nor until it has been boiled, shall sell or use such milk, or any mixture of such milk, for food of swine or other animals.

#### RECEPTACLES FOR GARBAGE, ETC.

September 6, 1892.

*Ordered,* That no person, unless authorized so to do, be allowed to handle, disturb, or remove the contents of any receptacle for garbage or rubbish of any kind placed in the yards, passageways, or public streets.

#### DESTRUCTION OF CLOTHING, ETC.

September 10, 1892.

*Ordered,* That hereafter no articles of clothing or bedding in use shall be thrown overboard from any vessel in Boston Harbor without the written consent of the Board of Health or the Quarantine Physician; nor shall any such articles be removed from any vessel at her dock without such permission; such articles shall no longer be brought to the City to be destroyed, but shall be burned in the harbor, under the supervision of the Quarantine Physician, in the furnaces of the steamers.

#### OYSTER SHELLS.

October 17, 1892.

*Whereas,* The storing and handling of oyster shells near business and residential districts are attended by noisome and injurious odors, it is hereby ordered that no oyster shells shall be kept in or removed from any building, yard, or other

place within the built-up portions of the City, except by written permission from the Board of Health, and only at such times and in such manner as shall be prescribed in said permit.

#### QUARANTINE.

March 4, 1893.

At a meeting of the Board of Health, this day, it was ordered that the several quarantine regulations, now in force at this port, be revised so as to read as follows:

*Ordered,* That any vessel arriving at this port, which has on board at the time of her arrival, or has had during her passage to this port, any sickness of a contagious infectious, or doubtful character which may be dangerous to the public health, or which has come from or has been in any port or place which has been epidemically infected with any contagious or infectious disease within the six months next preceding such arrival, or has on board any merchandise which has come by transshipment from any such infected port or place within the six months next preceding, or has on board any immigrants (except from British America) shall be anchored at quarantine.

Infected persons found on such vessels shall be removed to the hospital on Gallop's Island, and there detained until all power to infect others shall have ceased. Cargoes and personal baggage, which in the opinion of the Port Physician or the Board of Health may be infected, shall be removed to Gallop's Island and there disinfected, when such disinfection cannot be properly done on board the vessels or on lighters.

All immigrants, on arrival at quarantine, shall be subjected to examination as regards their freedom from contagious or infectious disease and their protection from small-pox.

All persons under ten years of age who have not been successfully vaccinated, and all persons over ten years of age who have not recently been successfully vaccinated or revaccinated, shall be considered as unprotected from the effect of the contagion of small-pox, persons having had an attack of small-pox excepted.

All persons not so protected shall be vaccinated or subjected to a quarantine of fifteen days' observation.

All old rags, paper stock, hair, feathers, hides, skins, wool, and similar materials which are liable to convey disease germs must be accompanied by satisfactory certificates as to their place of collection and packing for shipment.

No article of clothing or bedding in use shall be thrown overboard from any vessel in Boston Harbor without the

written consent of the Board of Health or the Quarantine Physician; nor shall any such article be removed from any vessel at her dock without such permission; all such articles which are to be destroyed shall be burned in the harbor under the supervision of the Quarantine Physician, in the furnaces of the steamers.

No vessel shall leave quarantine, nor shall her cargo, or any part thereof, be discharged, nor any person be allowed to go on board or to leave her while in quarantine, without the written permit of the Port Physician, who is hereby authorized and instructed to take such measures with regard to said vessel, cargo, and persons, as, in his judgment, the public health may require.

It is also hereby ordered, that during June, July, August, September, and October, of each year, subject to such changes as circumstances may from time to time require, all vessels arriving in this harbor from the following ports shall stop at the Quarantine Station, viz.: All vessels from any port in Europe, from the Western, Maderia, Canary, or Cape de Verde Islands; from the Mediterranean or Straits thereof, from the west coast of Africa, or around the Cape of Good Hope; from the West India, Bahama, or Bermuda Islands; from any American port south of Virginia, including Central and South America; and vessels arriving from any place in the United States or British America, where they may have touched on their way from any foreign port or place above named.

No such vessel shall leave quarantine or unload her cargo or any part thereof, nor shall any person go on board or leave the vessel while in quarantine without the written permit of the Port Physician, who is hereby authorized and instructed to take any measures in regard to such vessels, as, in his judgment, the public health may require.

The Port Physician is hereby authorized and instructed to demand and receive the quarantine fees which are hereby made and established by this Board, and which are as follows:

For examination of vessels of 500 tons and upward (registration tonnage), eight dollars.

For examination of vessels under 500 tons (registration tonnage), five dollars.

For disinfecting vessels, from ten to fifty dollars.

For baths and disinfecting personal clothing and baggage, one dollar for each person.

For vaccination, twenty-five cents for each person.

For board of patients in hospital, ten dollars a week.

Such fees to be by the Port Physician paid to the City Treasurer.

#### DEPOSIT OF REFUSE.

March 30, 1893.

*Voted*, That, whereas, in the opinion of the Board of Health, the use of refuse materials in filling ponds and bodies of water and wet lands is a nuisance, source of filth, and cause of sickness, it is therefore

*Ordered*, That no person shall throw into any pond or body of water or upon any land which at any time is covered with tide-water, within the limits of the City, any refuse, animal or vegetable matter, or any perishable material or rubbish or filth of any kind whatsoever, between the first day of April and the first day of November, except in accordance with a written permit issued from the Board of Health to the owner of such pond or land, and no owner of such pond or land shall refuse or neglect to remove therefrom any refuse or filth hereinbefore described which shall be thrown or placed in or upon the same within the period hereinbefore specified.

#### FILLING FOR PONDS AND WET LANDS.

April 10 1893.

*Whereas*, In the opinion of the Board of Health, the use of refuse materials in filling ponds and bodies of water and wet lands is a nuisance, source of filth, and cause of sickness, it is therefore ordered that no person shall throw into any pond or body of water, or upon any land which at any time is covered with tide-water, within the limits of the City, any refuse, animal or vegetable matter, or any perishable material or rubbish or filth of any kind whatsoever, between the first day of April and the first day of November, except in accordance with a written permit issued from the Board of Health to the owner of such pond or land, and no owner of such pond or land shall refuse or neglect to remove therefrom any refuse or filth hereinbefore described which shall be thrown or placed in or upon the same within the period hereinbefore specified.

#### TEXAN CATTLE.

July 29, 1893.

*Whereas*, Northern and Western cattle exposed to those coming from Texas, or to the premises which have been used by Texan cattle, are likely to contract a disease known as Texas fever among cattle, it is therefore ordered that none of the cattle arriving from Texas shall be driven over any road or across any lands which are used or liable to be used

by other cattle, nor in any way exposed to such other cattle within the limits of Boston, except within the yards immediately connected with the abattoir.

#### STORAGE OF FRUIT.

August 3, 1893.

No person shall store or keep or allow to be stored or kept in any building of which he is the owner or occupant, and which is in use in whole or in part as a dwelling-house, any fruit or merchandise, except in accordance with a written permit from the Board of Health.

#### KILLING OF POULTRY.

July 16, 1896.

That no live chickens, geese, ducks, or other fowls, shall be brought into, or kept, or held, or offered for sale, or killed or plucked, in any place in the City of Boston, without a permit thereof in writing from the Board of Health, which shall be subject to revocation by said Board at any time.

#### SPITTING IN STREET CARS AND UPON SIDEWALKS.

At a meeting of the Board of Health, March 23, 1899, the regulation dated October 13, 1896, respecting spitting in street cars, was amended so as to read as follows:

“The Board of Health hereby adjudges that the deposit of sputum in public places is a nuisance, source of filth, and cause of sickness, and hereby orders: That spitting upon the floor, platform, or steps of any railroad, or railway station, car, public building, hall, church, theatre, market, or any sidewalk immediately connected with said public places, be, and hereby is, prohibited.”

#### OFFENSIVE TRADES.

October 13, 1896.

The Board of Health hereby forbids the exercise of the trades or employments of slaughtering animals, rendering animal-matter (except fresh tallow), manufacturing fertilizers, mixing or storing refuse, animal or vegetable substances, smoking fish or meat, refining oils, making varnish, asphaltum, glue, gas, gasoline, or any burning fluid within the limits of the City of Boston, except at such place or places as may be assigned by said Board; such trades or employments being nuisances, hurtful to the inhabitants of said City, dangerous to the public health, attended by noisome and injurious odors, and otherwise injurious to the estates of said inhabitants.

## PEDLERS.

The following laws have been passed by the State and City for the government of pedlers:

No person shall sell any articles to any person on a public street or go from house to house selling articles, or cry his goods in the street and ways, unless he is a minor, licensed by the Clerk of Committees to sell articles, or he has received a permit from the Superintendent of Streets to sell articles on a public street, recorded his name and place of residence with the Board of Health, and receive from said Board a record number.

No such permit or number shall be given to or used by any person unless the person sells only the following articles, produced or grown in the United States, viz.: Brooms, live animals, fruits, provisions, agricultural products or implements, hand tools used in making boots and shoes, fuel, newspaper, books, pamphlets, or the products of his own labor or the labor of his family other than jewelry, wines, spirituous liquors, indigo, playing cards, or feathers; or the person has received a license as Hawker and Pedler from the Secretary of the Commonwealth *and* — is an honorably discharged soldier or sailor of the late war, *or* — is over seventy years of age, *or* — has paid the City Treasurer twenty-five dollars, *or* — is qualified to vote and has paid a tax on his stock in trade in Boston, *or* — is licensed by said Secretary as a Hawker and Pedler throughout the Commonwealth or throughout the County of Suffolk.

No person selling articles shall refuse or neglect to exhibit his permit, license, and certificate whenever the same is demanded by any public officer.

No person shall sell spirituous liquors, wines, jewelry, feathers, playing cards, or indigo.

No person shall have in his possession, with intent to sell, fish of any kind, unless they are kept in covered stalls or fish-boxes, or in covered carts, well secured from the rays of the sun, nor any fish other than flounders, smelts, or other small fish, salmon or shad, unless they have been cleansed of their entrails and other refuse parts.

No person selling articles shall carry them in any vehicle or receptacle, unless the same is neat, clean, and free from leaks, and has printed upon it his name, the number of his license, and the number given him by the Board of Health, in letters and figures at least two inches in height.

No person selling articles shall carry them in any manner that will injure or annoy the public health or comfort.

No person selling articles shall cry his wares to the disturbance of the peace and comfort of the inhabitants.

No person shall place or permit to remain in any street for more than ten minutes any of his goods or articles without a permit from the Superintendent of Streets.

No person shall, on foot in any street, carry or display any show-card, placard, or sign without a permit from the Superintendent of Streets.

No person selling articles shall stop or stand with a cart, wagon, or other vehicle for the purpose of hawking, peddling, or selling goods, wares, merchandise, fruit, or other articles, between the hours of eight o'clock A.M. and half-past six o'clock P.M., in or occupy any part of the following streets, ways, or squares; namely, Haymarket square, Sudbury street, Court street from Sudbury street to Scollay square, Scollay square, Tremont street from Scollay square to Eliot street, Eliot street from Tremont street to Washington street, Washington street from Eliot street to Franklin street, Franklin street from Washington street to Devonshire street, Devonshire street from Franklin street to Milk street, Milk street from Devonshire street to Pearl street, Post Office square, Water street to Washington street, State street, between Merchants row and Devonshire street, and Washington street from Adams square to Haymarket square, or any of the streets, ways, or squares included within the territory bounded as above described, or except in accordance with an order of the Board of Aldermen, stop or stand in, or occupy any part of the streets, ways, and squares in the City proper, north of Massachusetts avenue, with a hand-cart or wheelbarrow, for the purpose of hawking, peddling, or selling any goods, wares, or merchandise, fruit, or other articles, between the hours of eight o'clock A.M. and half past six P.M.

No person shall sell or expose for sale by public auction any articles except in such place as is expressly described or set forth in his license or permit.

[Public Statutes, ch. 68; 1883, ch. 118 and 168; 1885, ch. 305 and 309; 1887, ch. 422 and 445; 1889, ch. 331 and 457; 1890, ch. 448 and 449; 1891, ch. 144; 1894, ch. 525; Rev. Ord., 1892, ch. 43; Rev. Reg., 1892, ch. 6.]

#### CONTAGIOUS DISEASES.

March 10, 1897.

At a meeting of the Board of Health, this day, it was voted to amend the regulation of July 1, 1895, respecting contagious diseases, so to read as follows:



1. Whoever is infected with small-pox, scarlet fever, diphtheria, or membranous croup, shall immediately proceed to some isolated place or room designated by the Board of Health, and no person who has been so affected shall leave such place or room, and no article shall be removed from such place or room until the Board of Health shall certify in writing that all danger of communicating such disease to others is passed.

2. Every parent or guardian of any child or ward infected with small-pox, scarlet fever, diphtheria or membranous croup, shall immediately cause such child or ward to be conveyed to some isolated place or room approved by the Board of Health, and no parent or guardian shall permit such child or ward to remove from such place or room until the Board of Health shall find and certify in writing that all danger of communicating such disease to others has passed.

3. No person other than the attending physician, nurse, and agents of the Board of Health, shall enter, *nor shall any dog, cat, or other animal be allowed to enter* any apartment or other place set apart for the treatment of small-pox, scarlet fever, diphtheria, or membranous croup until the Board of Health shall certify in writing that such apartment or place has been satisfactorily disinfected.

4. No person having the care of any other person who has been infected with small-pox, scarlet fever, diphtheria, or membranous croup, shall advise or permit such other person to leave any place designated by the Board of Health as a place of isolation of such infected person before said Board of Health shall have certified in writing that such person can leave such designated place without danger to others.

5. No physician who has been in attendance upon any person who has been infected with small-pox, scarlet fever, diphtheria, or membranous croup, shall advise or knowingly permit such person to leave any place designated by the Board of Health as a place of isolation of such infected person before said Board of Health shall have certified in writing that such infected person can leave such place without danger to others.

#### MILK.

December 22, 1898.

*Whereas*, In the opinion of the Board of Health infectious diseases are spread by the distribution of milk produced, stored, and distributed under improper conditions; it is, therefore,

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NOTE. — The amendment is shown by words in italics.

*Ordered,* That the following regulations be and hereby are adopted :

#### ARTICLE I.

SECTION 1. All persons in the City of Boston engaged in the production of milk for sale, or in the business of selling, delivering, or distributing milk in said City, shall annually on the first day of May, or within thirty days thereafter, make written application to the Inspector of Milk, on forms prescribed by the Board of Health, for a license.

SECT. 2. No person in said City shall engage in the business of producing milk for sale, or in the sale or distribution of milk in the City of Boston, without a license so to do, under these regulations and such other conditions as the Board of Health may impose ; said license to be revoked if the licensee fail to comply with the conditions of his license or the regulations of this Board.

SECT. 3. The conditions under which every cow is kept whose milk is brought into the City of Boston, or kept, delivered, distributed, sold, or offered for sale in said City, shall be made known by the license to the Inspector of Milk in such detail as the Board of Health may require, and shall be approved by said Board ; and no milk except that derived from such cow shall be brought, kept, delivered, distributed, sold, or offered for sale in said City.

SECT. 4. No milk shall be sold, offered for sale, or distributed in the City of Boston unless the cows from which it is derived have, within one year, been examined by a competent authority, and shown to be free from diseases dangerous to the public health ; but this shall not be construed as forbidding the sale or use of milk from cows not tested with tuberculin.

SECT. 5. All persons having a permit or license to sell, deliver, or distribute milk in the City of Boston, shall keep a copy of the license constantly posted in a conspicuous place on the premises, and shall have his name and the number of his license marked in plain uncondensed Gothic letters, not less than one inch in height, on vehicles used by him in the conveyance and sale of milk.

#### ARTICLE II.

SECTION 1. No milk for sale or distribution shall be stored in that portion of a building which is used for the stabling of horses, cows, or other animals, or for the storing of manure,

or in any room used in whole or in part for domestic or sleeping purposes.

SECT. 2. No person in the City of Boston engaged in the business of producing milk for sale, and no person engaged in the business of storing or delivering milk in said City, shall store, cool, or mix said milk in any room which is occupied by horses, cows, or other animals. All rooms in which milk is stored, cooled, or mixed, shall be provided with tight walls and floor and kept constantly clean. The walls and floors of said rooms to be of such a construction as to allow easy and thorough cleansing. The room or rooms aforesaid shall contain proper appliances for washing or sterilizing all utensils actually employed in the storage, sale, or distribution of milk, and all such apparatus and utensils shall be washed with boiling water or sterilized by steam regularly after being so used.

SECT. 3. No urinal, water-closet, or privy shall be located in the rooms called for in the preceding section, or so situated as to pollute the atmosphere of said rooms.

SECT. 4. All milk produced in the City of Boston for sale shall be strained, cooled or stored as soon as it is drawn from the cow.

#### ARTICLE III.

SECTION 1. Milk kept for sale in any store, shop, restaurant, market, bakery, or other establishment, shall always be kept in a covered cooler, box, or refrigerator, properly drained and cared for, and while therein shall be kept tightly closed and only in such locations and under such conditions as shall be approved by the Board of Health.

#### ARTICLE IV.

SECTION 1. All cans, bottles, or other vessels of any sort, used in the retail sale, delivery or distribution of milk to the consumer, must be cleaned or sterilized before they are again used for the same purpose, and it shall be deemed a sufficient reason for forfeiture of license for any milk dealer to fail so to do.

SECT. 2. No person shall use in any way a milk vessel for any other substance than milk, and any licensed milk dealer who shall so misuse such vessel shall be liable to forfeiture of license.

#### ARTICLE V.

SECTION 1. Every person engaged in the production, storage, transportation, sale, delivery, or distribution of milk

shall immediately on the occurrence of any case or cases of infectious disease either in himself or in his family, or amongst his employees or within the building or premises where milk is stored, sold or distributed, notify the Board of Health, and at the same time shall suspend the sale and distribution of milk until authorized to resume the same by the Board of Health. No vessels which have been handled by persons suffering from such diseases shall be used to hold or convey milk until they have been thoroughly sterilized.

#### MILK.

August 31, 1900.

At a meeting of the Board of Health, this day, the following regulation was adopted:

"No milk drawn from a cow in the City of Boston within forty-eight hours after said cow is brought into said City shall be sold or used for human food, and all milk drawn from any cow within forty-eight hours after said cow is brought into said City shall be destroyed within one hour after it is drawn from the cow."

#### STORAGE OF REFUSE.

January 21, 1901.

At a meeting of the Board of Health, this day, it was voted to amend its regulation, passed February 28, 1899, prohibiting the storage of rags, old paper, and other refuse material in any building used as a dwelling, so as to read as follows:

*Whereas*, It is a practice in this City to collect rags, old paper, junk, and other refuse material, from dumping-grounds, streets, and other places, and to store, sort, and otherwise handle the same within dwellings, and

*Whereas*, In the opinion of this Board, such rags, old paper, junk, and other refuse material are a source of filth, and capable of conveying infectious diseases from person to person, and of otherwise creating sickness, therefore

*Ordered*, That on and after this date, no rags, old paper, junk, or other refuse material, gathered or recovered from any source, shall be brought into or allowed to remain within any building used as a dwelling.

#### RULES FOR LODGING-HOUSES.

March 22, 1898.

The following rules have been adopted by the Board of Health for the government of lodging-houses:

1. The means for light and ventilation must be satisfactory to the Board of Health and beyond the control of lodgers.
2. All floors and stairways must be sound, smooth, and either painted or shellacked.
3. There shall be allowed not less than 300 cubic feet of space to each lodger in sleeping rooms.
4. Open and spacious dormitories will be preferred.
5. Single or small rooms will be allowed only in exceptional cases, and then only with fireproof partitions.
6. No carpeting will be allowed on floors or stairways.
7. There shall not be less than two horizontal feet between the sides of any two beds.
8. All bedsteads must be single and of iron.
9. Blankets will be required and "comforters" will be prohibited.
10. Mattresses must be covered with a waterproof covering.
11. No person will be allowed to retire or sleep in his day clothing.
12. No person who is not clean will be allowed to retire without a bath.
13. Water-closets (one to every 20 lodgers), lavatories and shower bath, with hot and cold water, all with open plumbing, must be furnished on each floor, and the floors to same shall be of marble, slate, or concrete.
14. All movable receptacles for excretions are prohibited.
15. Smoking in sleeping rooms is prohibited.
16. All stairways, fire-escapes, and other means of exit in case of fire must be in accordance with the statutes and ordinances on that subject, and to the satisfaction of the Building Commissioner.
17. Stoves for heating will be allowed only under the most favorable conditions for safety.
18. The use of portable kerosene lamps is prohibited.
19. A reliable person or persons must be in attendance at all hours of the night.

#### BARBER SHOPS.

May 4, 1900.

At a meeting of the Board of Health, this day, the following regulation respecting barber shops was adopted:

The place of business, together with all the furniture, shall be kept, at all times, in a cleanly condition.

Mugs, shaving brushes and razors shall be sterilized by immersion in boiling water after every separate use thereof.

A separate, clean towel shall be used for each person.

Alum, or other material, used to stop the flow of blood shall be so used only in powdered form, and applied on a towel.

The use of powder-puffs is prohibited.

The use of sponges is prohibited.

Every barber shop shall be provided with running hot and cold water.

No person shall be allowed to use any barber shop as a dormitory.

Every barber shall cleanse his hands thoroughly immediately after serving each customer.

#### ICE DEALERS.

May 9, 1900.

*Ordered,* That each and every party selling ice in Boston, fill out over the signature of the chief clerk or other responsible officer of the party and return to the Board of Health at its office, Old Court House, Boston, Mass., on or before June 1 of the year, a blank of the following form:

1. Give the name and situation of each and every river, brook, pond or lake from which you cut ice, and the approximate number of tons you cut annually from each.

2. Give the name of each and every party from whom you take ice to sell and the approximate number of tons taken annually from each.

3. Give the situation of each and every storehouse, depot, agency, railroad terminal, or other place from which you take your ice into vehicles for distribution in Boston.

4. Give the name of each and every party distributing ice in Boston to whom you regularly or occasionally supply ice, and the approximate number of tons supplied to each.

5. Do you classify the ice you sell as "For drinking purposes," "For cooling purposes only, not to be used for drinking," etc.?

6. Do you sell "snow ice?"

7. Do you flood your ice field?

8. Do you have chemical analyses made for you of the water used or of the ice therefrom?

9. Do you take precautions to maintain your sources of supply in good, clean and wholesome condition, and, if so, what?

#### POULTRY.

July 24, 1900.

At a meeting of the Board of Health, this day, the law relating to the killing of poultry, passed July 16, 1896, was amended so as to read as follows:

No live chickens, geese, ducks or other fowls, shall be brought into, or kept, or held, or offered for sale, or killed or plucked, in any place in the City of Boston, without a permit therefor in writing from the Board of Health, which shall be subject to revocation by said Board at any time.

No carcass of any hen, chicken, turkey or goose shall be brought into, or exposed for sale in the City of Boston, unless the feathers have been removed from said carcass before the same is brought within the City limits.

#### REFUSE.

July 31, 1900.

At a meeting of the Board of Health, this day, it was voted to amend the regulation prohibiting the removal of refuse, etc., passed by this Board September 8, 1876, so that it will read as follows :

*Ordered*, That no person removing earth, dirt, sawdust, soot, ashes, shavings, hair, shreds, manure, oysters, clams, or lobsters, waste water, or any animal or vegetable substance, house offal, swill, rubbish or filth of any kind whatsoever, shall suffer it to leak, escape or drop from any vehicle by him owned or driven into or upon any street, court, square, lane, alley, wharf or public enclosure in the City of Boston, or suffer offensive odors to escape from such vehicles to the discomfort or annoyance of people residing, doing business or travelling on the route over which such vehicles are driven. Nor shall any person engaged in collecting any of the articles heretofore enumerated suffer any vehicle to remain standing in any street, court, square, lane, alley, wharf or public enclosure in the City of Boston, except for the purpose of removing the refuse so collected, for a longer time than ten consecutive minutes.

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#### CONTAGIOUS DISEASES.

December 24, 1900.

At a meeting of the Board of Health, this day, the regulation respecting contagious diseases, adopted July 1, 1895, was amended so as to read as follows :

Whoever is infected with small-pox, scarlet fever, diphtheria, or croup, shall immediately proceed to some isolated place or room designated by the Board of Health, and no person who has been so affected shall leave such place or room, and no article shall be removed from such place or

room, until the Board of Health shall certify, in writing, that all danger of communicating such disease to others is passed.

Every parent or guardian of any child or ward infected with small-pox, scarlet fever, diphtheria, or croup, shall immediately cause such child or ward to be conveyed to some isolated place or room approved by the Board of Health, and no parent or guardian shall permit such child or ward to remove from such place or room until the Board of Health shall find and certify, in writing, that all danger of communicating such disease to others has passed.

No person other than the attending physician, nurse, and agents of the Board of Health shall enter any apartment or other place set apart for the treatment of small-pox, scarlet fever, diphtheria, or croup, until the Board of Health shall certify, in writing, that such apartment or place has been satisfactorily disinfected.

No person having the care of any other person who has been affected with small-pox, scarlet fever, diphtheria, or croup, shall advise or permit such other person to leave any place designated by the Board of Health as a place of isolation of such infected person before said Board of Health shall have certified, in writing, that such person can leave such designated place without danger to others.

No physician who has been in attendance upon any person who has been infected with small-pox, scarlet fever, diphtheria, or croup, shall advise or knowingly permit such person to leave any place designated by the Board of Health as a place of isolation of such infected person before said Board of Health shall have certified, in writing, that such infected person can leave such place without danger to others.

In cases of small-pox, all crusts resulting from the pustules must have disappeared, and the patient, and all infected articles, be disinfected before being released from isolation.

In cases of scarlet fever, all traces of desquamation must have disappeared, and the patient, and all infected articles, be disinfected before being released from isolation.

In cases of diphtheria, all traces of the false membrane must have disappeared, two consecutive negative cultures from both nose and throat be obtained (the second one to be obtained by an agent of the Board of Health), and the patient, and all infected articles, be disinfected before being released from isolation.



## DIPHTHERIA.

Revised October, 1899.

The following circular is issued for the purpose of reminding all persons that greater care should be exercised to prevent the spread of this disease. Diphtheria is an infectious disease, and may be easily communicated from person to person. It may be conveyed directly in the act of kissing, coughing, spitting, sneezing; or indirectly by infected articles used, as towels, napkins, handkerchiefs, etc. The patient's fingers are constantly carrying the bacilli from the mouth and nose to whatever thing he touches. The poison clings with great tenacity to rooms, houses, furniture, clothing and other things, and may occasion the disease even after the lapse of months. Diphtheria attacks all classes at all ages and at all seasons of the year. By preference it attacks children and those who are debilitated from exposure to filth, dampness or foul air from whatever source. When a case of diphtheria occurs in any family the sick person must be placed in a room apart from the other inmates of the house, be nursed as far as possible by one person only, and remain isolated or be taken to the hospital. All doubtful cases should be referred for diagnosis to the laboratory of the Health Department. The sick chamber should be well warmed, exposed to sunlight and well aired. Its furniture should be such as will permit of cleansing without injury, and all extra articles, such as window and table drapery, woollen carpets, upholstered furniture and all hangings should be removed from the room during the sickness. The physician and nurse, as a rule, should be the only person admitted to the room.

Visitors to the infected house should be warned of the presence of a dangerous disease therein, and children especially should not be admitted. All clothing removed from the patient, nurse, or their beds, should be at once placed in a solution of corrosive sublimate (one drachm of corrosive sublimate and eight drachms of common salt to each gallon of water — 1 in 1,000 — in a wooden vessel marked "Poison") by the nurse before being carried through the house or handled by any other person. They may be soaked in this fluid for a convenient time and then *boiled* for one-half hour. It is better not to use handkerchiefs for cleansing the nostrils and mouth of the patient, but rather soft rags, which should be immediately thereafter burned. All vessels for receiving the discharges of the patient should constantly contain some of the disinfecting liquid. Water-closets and privies in the house should be disinfected daily with a solution of fresh

chloride of lime (half a pound to the gallon of water). Every kind and source of filth in and around the house should be thoroughly removed and disinfectants freely used. Cleanliness tends both to prevent and mitigate the disease. Drains should be put in perfect order and ventilated. Children in the family should not attend school or mingle with other children until the patient has wholly recovered, has yielded two successive negative cultures, all infected articles have been disinfected, and these facts certified by the Board of Health. On the recovery, removal or death of the patient the most thorough disinfection should follow; this will be done by the Board of Health. After disinfection has been done the room and everything in it should be thoroughly aired. The walls and ceilings should be brushed and the floors and other woodwork washed with the solution of corrosive sublimate, and all vessels and utensils used in the room should be thoroughly washed with the same solution. All wash-bowls, water-closets, sinks and slop-hoppers should be thoroughly washed with the solution of chloride of lime.